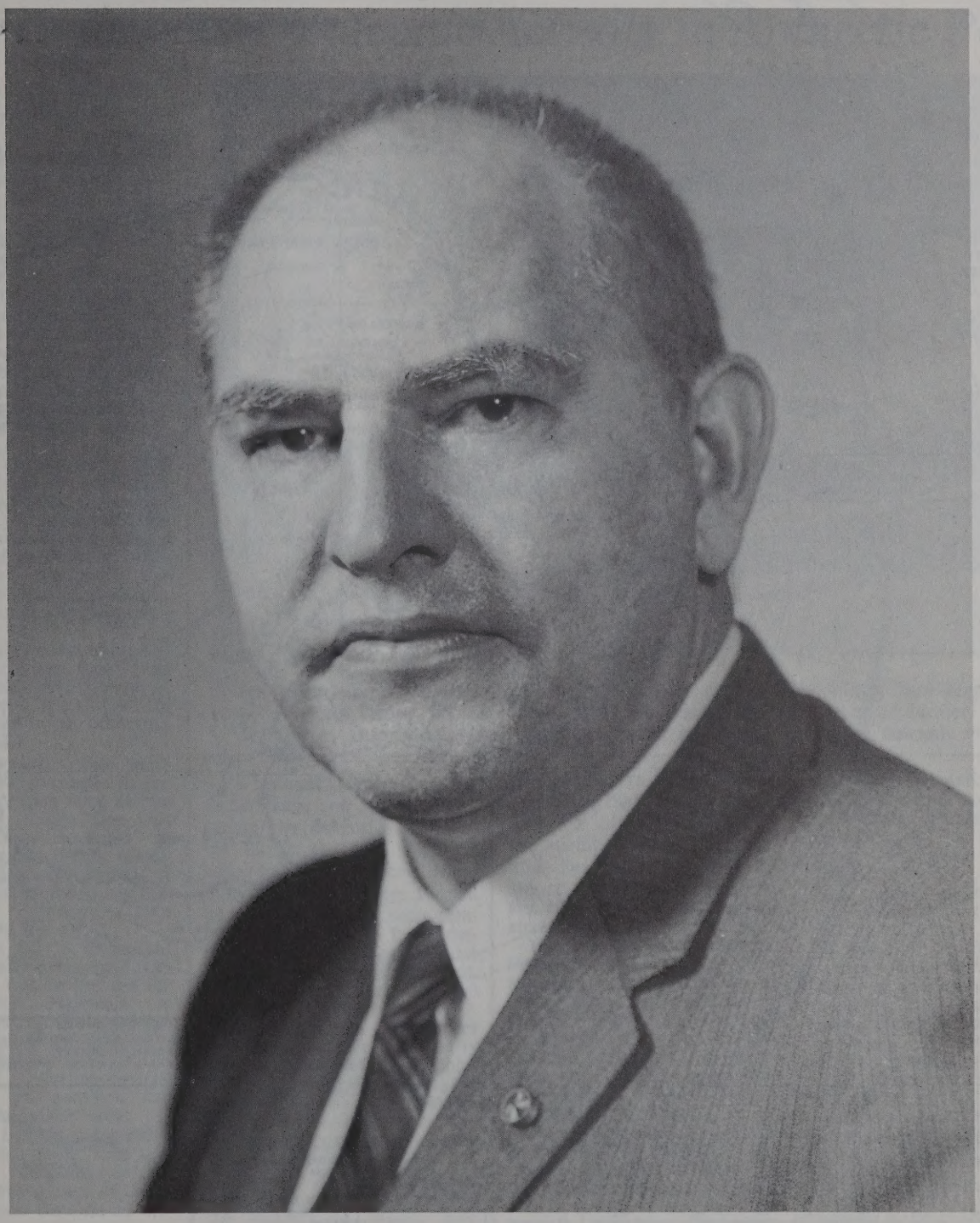
THE POLAR TIMES

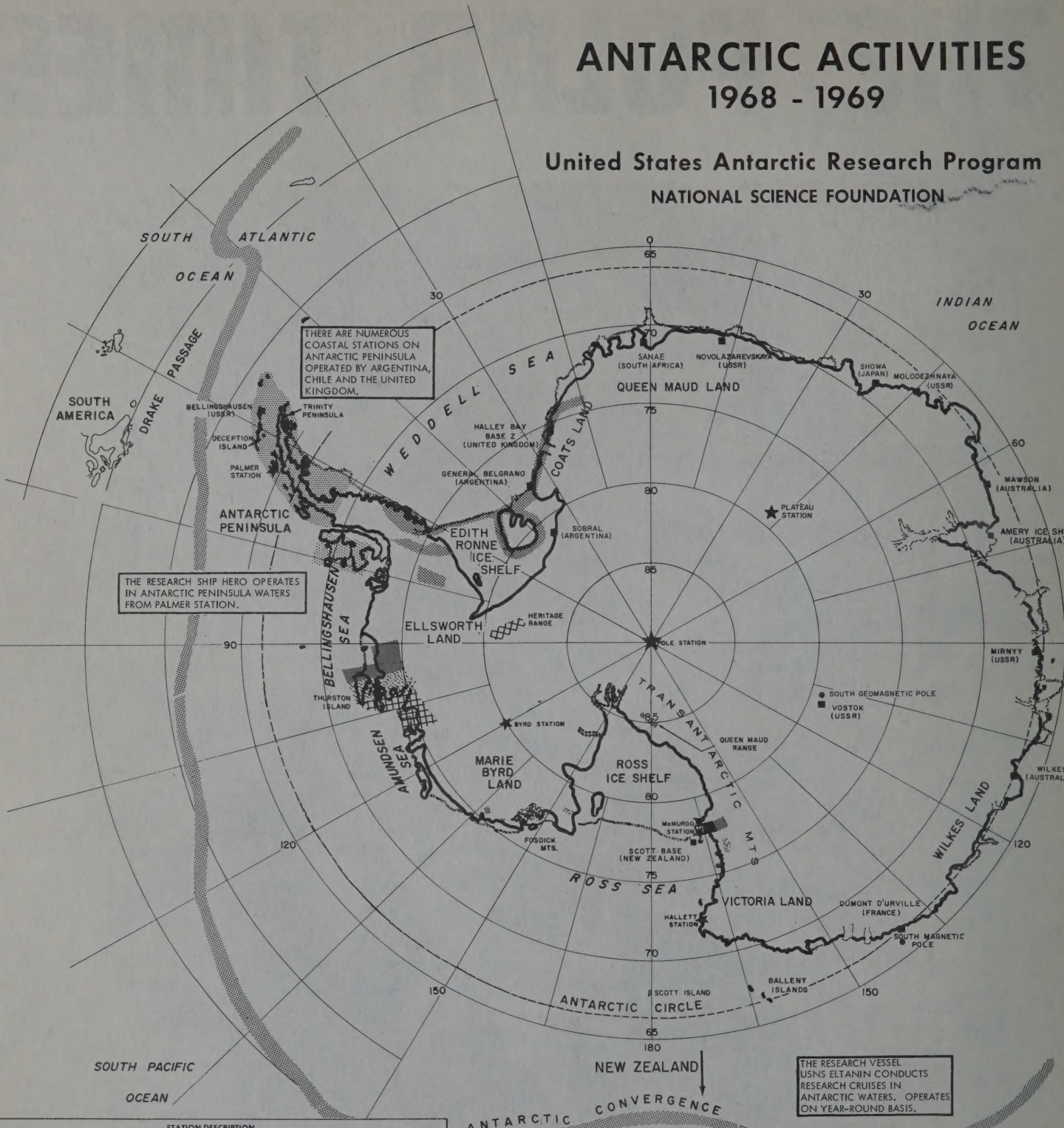


DR. PAUL A. SIPLE
Dec. 18, 1908 - Nov. 25, 1968
Founding President 1934-1940
of the
American Polar Society

ANTARCTIC ACTIVITIES
1968 - 1969

United States Antarctic Research Program

NATIONAL SCIENCE FOUNDATION



STATION DESCRIPTION

	BYRD	HALLETT (U.S.-NEW ZEALAND)	McMURDO	PALMER	PLATEAU	POLE	USNS ELTANIN	RV HERO
LOCATION	LAT. 79° 59'S LONG. 120° 01'W	LAT. 72° 18'S LONG. 170° 18'E	LAT. 77° 51'S LONG. 166° 37'E	LAT. 64° 45'S LONG. 64° 05'W	LAT. 79° 15'S LONG. 40° 30'E	LAT. 90°S	SOUTHERN PACIFIC/ INDIAN OCEANS	ANTARCTIC PENINSULA WATERS FROM PALMER STA.
FEET ABOVE SEA LEVEL	5,012	16	102	23	11,690	9,184	-	-
ESTABLISHED	1957	1957	1956	1965	1966	1957	1962	1968
TERRAIN	ON INLAND ICE	ON GLACIAL MORAINE	ON VOLCANIC ASH	ON BEDROCK	ON INLAND ICE	ON INLAND ICE	-	-
METHOD OF SUPPLY	AIR	AIR SEA	AIR SEA	SEA	AIR	AIR	-	-
NUMBER OF BUILDINGS	15	10	70	2	8	11	-	-
MEAN ANNUAL TEMPERATURE (°F)	-18.6	+4.2	+0.1	+20 (estimated)	-69.9	-56.7	-	-
MEAN TEMP. (°F) DEC., JAN., FEB.	+1.6	+28.2	+21.6	+30 (estimated)	-37.9	-25.2	-	-
APPROXIMATE WINTER PERSONNEL (SCIENTISTS) (NAVY)	11 17	SUMMER STATION ONLY	11 146	8 6	STATION CLOSES JANUARY 1969	6 13	scientists 34 MSTS crew 48 (year-round operation)	scientists 10 crew 10 (year-round operation)
AIR DISTANCE FROM McMURDO (STATUTE MILES)	885	380	-	2,360	1,350	820	-	-

LEGEND

- ★ U.S., U.S. Cooperative Stations
- ■ Foreign Stations
- Aerial Photography for Mapping
- Geological Field Parties
- Map Control
- Biological Field Parties
- Geophysical Investigations

Upper Atmosphere Studies conducted at Byrd, Plateau, Pole, and McMurdo Stations.

The Polar Times

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No. 67 *DECEMBER 1968*

Find Evidence of Volcanic Activity in Antarctic Peaks

By WALTER SULLIVAN

The New York Times

Nov. 1

Two American scientists have reported evidence that at least two mountains deep within Marie Byrd Land periodically spout steam into the frigid Antarctic sky.

This report of apparent volcanic activity and another report by a New Zealand expedition suggest that a number of Antarctic mountains may be like many-layered hot fudge sundaes. That is, instead of being formed purely of rock, they may contain both ice and ash layers.

These discoveries help close the "ring of fire" that encircles the Pacific Ocean. For reasons not yet understood, the Pacific is fringed by a belt of volcanic and earthquake activity. However, the poorly explored continent of Antartica has represented a gap in that belt.

One newly discovered area of volcanic activity there has made possible the existence of a miniature "oasis," where mosses thrive in an otherwise frozen world.

Until recently the only known active volcanoes in the South Polar region were at two sites on its fringes. One was Mount Erebus, a dome of ice and volcanic debris towering over McMurdo Sound. It steams almost continuously and occasionally throws lava "bombs" into the air.

The other site is Deception Island, a crater submerged, except for its rim, in the sea off the Antarctic Peninsula. A breach in the rim enables ships to take refuge there, making it one of the best harbors in those latitudes.

However, on occasion the water in the harbor boils, removing the bottom paint from ships at anchor there. Last December an eruption forced emergency evacuation of British and Chilean stations on the island.

The most recent discovery is reported in the current issue of Science by Dr. Wesley E. LeMasurier of the University of Colorado and Dr. F. Alton Wade of Texas Technological College. Dr. Wade was a member of several expeditions led by the late Rear Adm. Richard E. Byrd.

The New York Times Nov. 1, 1968

Ice pyramid on Antarctica's Mount Hampton, right above, is thought to have been formed by volcanic steam. In inset map, the hash marks indicate zones of former volcanic activity in Antarctic region. Black dots mark current or suspected volcanic eruptions.

On Mount Berlin in the Flood Range and Mount Hampton in the Executive Committee Range the two scientists have found great ice towers that they believe were formed by escaping steam. Both summits were examined from low-flying helicopters, and Mount Hampton was visited on foot. The ice towers are 30 to 60 feet high.

No steam was escaping at the time of their visit early this year. Nor could vent holes be seen from the helicopter. However, it was pointed out that snow could fill such holes within a few days after a pause in steam venting.

The New Zealand expedition that in January 1967 reached the summit of Mount Melbourne, to the west of the Ross Sea, found ice towers that were hollow and, in some cases, venting steam. The inside of one was large enough for all four members of the party to stand. The sulphurous fumes inside were, however, rather overwhelming.

Ice cliffs on the flank of this volcano show what seem to be alternate layers of ice and ash, suggesting that this may represent the internal structure of the mountain. A similar structure has been proposed for Mount Erebus, where ice towers, clearly formed by escaping steam, have also been found.

The ice towers on Mounts Melbourne and Erebus are considerably smaller than the reported dimensions of those on Mount Hampton. Dr. LeMasurier believes towers on the two coastal mountains may have been more subject to melting than those on Mount Hampton in the chilly interior.

Mount Melbourne forms such a perfect cone that early explorers who saw it from the sea likened it to Mount Etna in Sicily. In one place near the summit, the New Zealanders could hear water boiling beneath the surface. On the southwest side of the crater they found an oasis of moss on a patch of steaming ground measuring about 35 square yards.

The moss showed that the area had remained warm, winter and summer, for a considerable period. Dr. Fiorenzo C. Ugolini, formerly at Rutgers University and now with the Ohio State, has also reported a rich harvest of micro-organisms from warm ground on Mount Erebus.

A number of conical summits reaching northwest from Mount Melbourne are thought by the New Zealanders to be young volcanoes. Similarly, many mountains of Marie Byrd Land and the Antarctic Peninsula are known to be extinct volcanoes. Perhaps the first hint of recent activity was the 1959 observation by American scientists of volcanic rocks scattered over the ice sheet south of Mount Sidley.

That mountain is in the same range of volcanic summits as Mount Hampton. According to George A. Doumani, now at the Library of Congress, who was in the party that found these rocks, they were scattered as much as 15 miles south of the mountains. Since the ice flow is in the opposite direction, he doubts that the boulders were carried there by glacial movement.

Lava "bombs" and explosion fragments are common. The

material apparently erupted through a water layer, indicating that heat prior to the explosion may have melted ice inside the crater. Mr. Doumani points out that a number of large ice towers occur at the summit of Mount Sidley, but he believes they were formed by wind action.

Infrared scanning of the terrain south of McMurdo Sound has shown Mount Morning to be peculiarly warm. Hence it is suspected of incipient activity. Dr. Wade and Dr. LeMasurier propose that similar scanning of the mountains in Marie Byrd Land could show if they are, in fact, intermittent sources of steam.

Experts Say Antarctica Was Warm

Dec. 31

Antarctica, the vast, icy continent where few men but scientists visit, actually experienced a mild climate millions of years ago and strayed far from its polar home.

These are two of the conclusions reached in a report titled "Climate and Position of Antarctica Through Time" presented over the weekend to the Americaan Association for the Advancement of Science.

Two geologists, Lawrence A. Frakes and John C. Crowell of the University of California (at Los Angeles and Santa Barbara respectively) claim Antarctica has not always been a passive mass of ice.

"Abundant evidence" in rock formations show the continent has "strayed in and out" of high latitudes several times and at least once even approached the earth's equatorial belt.

Antarctica, the two men said at a symposia in the Sheraton-Dallas Hotel, has moved in fact in relation to the earth's poles of rotation.

"Today, the icy continent; yesterday, an area of sub-tropical vegetation, and the cycle is repeated far back into the earth's lengthy past," their report said.

"Lengthy" in geologists' terms is not an overstatement.

Glaciation in Antarctica began millions of years ago.

The warmer climate preceding this glaciation reaches back to 200 million years ago and possibly farther, the scientists said.

"It appears that Antarctica has made three major changes from warm to cold climates over a period of about 700 million years," Frakes and Crowell said.

Evidence also indicates Antarctica was grouped with other continents of the southern hemisphere to form a supercontinent called Gondwanaland.

These continents can be fitted together in their former positions according to coastline, the scientists point out, as eastern South America and western Africa.

Antarctica probably fitted close to Australia, according to matching coastlines and geologic trends.

Movement among these land masses, leading to eventual breakaway, probably began about 110 million years ago, the report says.

The Polar Times

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AUGUST HOWARD, Editor

THE POLAR TIMES highly recommends "The Polar Record," published by the Scott Polar Research Institute, Cambridge, England.

The American Polar Society was founded Nov. 29, 1934, to band together all persons interested in polar exploration. Membership dues are one dollar a year, which entitles members to receive THE POLAR TIMES twice a year.

Back issues are 50 cents each.

'Unique Impetus' Seen In Antarctic Treaty

Dec. 27

Americans are familiar with NATO, have a passing acquaintance with SEATO and read almost daily of the numerous treaties binding together nations of the world.

But the Antarctic Treaty — and its importance to science — is as remote from the headlines as Antarctica's icy desolation.

Dr. Louis O. Quam, chief scientist, Office of Antarctic Programs, National Science Foundation, pointed here Thursday to the "unique impetus" the treaty gave to projects on that continent.

Under the treaty, Antarctica is reserved for "peaceful purposes." The land area and ice shelves south of 60 degrees south latitude cannot be used for military maneuvers, nuclear testing or disposing atomic wastes.

Sixteen nations have signed the 1959 treaty — Argentina, Australia, Belgium, Chile, Czechoslovakia, Denmark, France, Japan, the Netherlands, New Zealand, Norway, Poland, Republic of South Africa, United Kingdom United States and Union of Soviet Socialist Republics.

The Antarctic, thus freed for scientific work, "is a unique laboratory for the study of Earth-sun relations," Dr. Quam told the American Association for the Advancement of Science.

The polar regions give a special vantage point to observe such phenomena as solar radiation, or charged particles moving from the sun to Earth.

Dr. Quam described "the vast ice sheet" which dominates the Antarctic as 2,500 miles across and more than a mile thick.

Whether the sheet is growing or shrinking is undetermined, he said.

Latest studies indicate, however, that more ice accumulates than is removed, Dr. Quam said at the Sheraton Dallas Hotel.

Sukiyaki for Polar Dinner

WELLINGTON, New Zealand Dec. 25 (AP) —Fifty men sat down to the traditional turkey and cranberry sauce at the South Pole today, but the Christmas dinner this year had an Oriental flavor. It included sukiyaki cooked by members of a Japanese party that stopped for the day at the United States Navy's polar base.

Alice Carol Merckens Is Bride Of R. L. Chappell, Biophysicist

The New York Times

BUFFALO, Sept. 6 — In Westminster Presbyterian Church here this afternoon, Miss Alice Carol Merckens, daughter of Mr. and Mrs. August Merckens, became the bride of Richard Lee Chappell. He is the son of Mr. and Mrs. G. Howard Chappell of Eggertsville.

The Rev. Ray Henry Kiely performed the ceremony and the bride's brother, the Rev. Lawrence Edward Merckens of Hallowell, Me., assisted.

The bride, a Vassar graduate of 1964, participated in the Experiment in International Living in 1960 in France. She was with the Sarah Lawrence College program in Florence, Italy, during the summer of 1963, attended the Goethe-Institüt in Bad Aibling, Germany, in 1965-66 and received a master's degree in art history last month from the University of Pennsylvania.

Mr. Chappell, who was graduated in 1962 from Princeton University, served as a Naval lieutenant and a representative of the Atomic Energy Commission at the Electric Boat Division in Groton, Conn., of the General Dynamics Corporation. He is a candidate for a Ph.D. degree in biophysics at the Johns Hopkins University.

At the age of 18, he was chosen to represent the Boy Scouts of America as a scientific aide at Little America in Antarctica. His book about his year's stay there in 1956-57, "Antarctic Scout," was published by Dodd Mead & Co., in 1959. He is a fellow of the Explorers Club of New York.

His father is accountant for the Buffalo Forge Company.

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Paul Siple, Polar Explorer, Dies

Geographer Visited Antarctica With Byrd Expedition

The New York Times

ARLINGTON, Va., Nov. 25—Dr. Paul Allman Siple, the polar explorer and geographer who spent more time on the Antarctic continent than any other human being is known to have done—over six years—died today in his office here at the Army Research Center. He was 59 years old.

As special science adviser to the Army since 1967, Dr. Siple had worked only a few hours a day following a severe stroke he suffered in 1966.

First Voyage at 19

On the afternoon of Aug. 25, 1928, a white, square-rigged ship moved slowly away from a Hoboken pier out into the rough waters of the Hudson River. This was the beginning of Comdr. Richard E. Byrd's first journey many thousands of miles south to the frozen, bleak and unknown world of the Antarctic.

Standing on the deck of the ship, among the scientists and the seamen, with the blue bandana of his Boy Scout uniform blowing in the wind, was 19-year-old Paul Siple.

He had been chosen among 600,000 Boy Scouts of America to accompany the explorer on his year-long expedition to the South Pole. Young Paul, from Erie, Pa., had never been south of New York.

Ahead of him was to be a lifetime of work dedicated to understanding the cold and the ice. He was determined to learn what happened in this quiet, awesome world where nothing lived but lichen and an occasional penguin, and how man's body and equipment adapted to its unusual requirements.

During the next 40 years Paul Siple returned to the South Pole six times. On the last journey, from 1957 to 1958, he directed the scientific investigations undertaken there by Americans in connection with the International Geophysical Year.

After Admiral Byrd—promoted for his feats—returned from his long expedition to the South Pole, he said:

"Everybody asks me about my Boy Scout. 'How's he doing?' they ask. He's the best known man I have, and he's one of the best."

On his first journey young Siple took care of the husky dogs. He was in charge of collecting seals and penguins to bring back to exhibit at the Museum of Natural History in New York.

Dr. Paul A. Siple with Rear Adm. Richard E. Byrd about to leave San Francisco in 1955 on a visit to the South Pole.

Dr. Siple in 1933, before he went on second expedition with Admiral Byrd.

As he accompanied Admiral Byrd into the Antarctic, the erstwhile Boy Scout held increasingly important positions. He came to be recognized as one of the leading authorities on this cold land.

"Once you've been here," he said late in his career, "there's something a little special about you—everyone feels it, and so do you. I think this may be what draws people down here, and even though they hate it, they feel it's worth it. It will last them a lifetime."

The 12 months that Dr. Siple spent in the Antarctic at a point closer to the South Pole than any human being had ever been before illustrated how profoundly his experiences differed from those of most people.

"From March 22 to Sept. 23," he said afterward, "there was absolutely no sun. Our nearest neighbors were 500 miles away, and they couldn't come to rescue us under any circumstances."

Isolated, except for occasional contact through a short-wave radio, he lived, with 18 other men, in seven small huts, sprinkled like crumbs on the vast desert of ice. Outside were fierce winds, temperatures as low as 102 degrees below zero and, for half the time, total darkness.

Born in Montpelier, Ohio, on Dec. 18, 1908, Dr. Siple grew up in Erie. He had one year at Allegheny College in Meadville Pa., before he first went to the South Pole. Upon his return he finished college, graduating in 1932 with a B.S. degree. In 1939 he received a Ph.D. in geography from Clark University.

In 1939 and 1940 Dr. Siple was chief geographer, technical supervisor of equipment and navigator for the Antarctic Service expedition under Admiral Byrd.

During World War II he served the Army as an expert on cold-weather operations. He was senior War Department observer in 1946 and 1947 for the Navy's Operation "Highjump" in Antarctica.

Dr. Siple was science adviser to the Research and Development Department of the Army from 1946 to 1963. He served as science attaché to the United States Embassy in Canberra, Australia, until 1966.

The author of four books—his latest was "90 Degrees South"—Dr. Siple held many honors, including the Legion of Merit and the Distinguished Civilian Service Award.

Surviving are his widow, the former Ruth Johannesmeyer, three daughters, Mrs. Michael H. Johnson of Monroe, Wis., Mrs. James P. Wertime of Arlington, and Mrs. Jeffrey W. Remington of El Paso; his mother, Mrs. Fannie Siple of Canton, Ohio; a sister, Mrs. Lester W. Kettering of Canton, and two grandchildren.

A funeral service will be held at St. George's Episcopal Church in Arlington at 1 P.M. Friday.

ADM. COLBERT, LED GEODETIC SURVEY

The New York Times

WASHINGTON, Dec. 24 — Rear Adm. Leo Otis Colbert, who directed the United States Coast and Geodetic Survey for 12 years until his retirement in 1950, died today at the Bethesda Naval Hospital. He would have observed his 85th birthday on Tuesday.

He was a native of Cambridge, Mass., and joined the survey in 1907 after receiving a civil engineering degree from Tufts College. His assignments included those of navigator, executive officer and commanding officer of survey ships on the coastal waters of the United States and the Philippines.

In 1939, he received an honorary Doctor of Science degree from Tufts.

After his retirement from Federal service, Admiral Colbert was appointed director of the Washington office of the Arctic Institute of North America.

Surviving are his widow, Florentine, and two daughters.

JAMES E. MOONEY

Washington, Oct. 27 (AP)—James E. Mooney, 67, polar authority and writer, died today in Suburban Hospital at nearby Bethesda, Md., after a heart attack.

A lifelong friend of Adm. Richard E. Byrd, who named an Antarctic mountain for him, Mooney had been active in the field of polar exploration since the 1920s. He was deputy director of the U. S. Navy's Antarctic projects at the time of his retirement in 1966. A native of Dansville, N. Y., he had degrees from New York State Teachers College, Duquesne University, Beaver College and Rider College.

Snow Runway Stamped Out

Eskimos stamped out an airstrip in the snow at Foxes Lake, Alaska, so a team from the National Transportation Safety Board could land near the site of the cash of a Wien Alaska Airlines F-27 plane, in which 38 persons were killed, the Aviation Daily reported.

Scientists Are Flocking to Antarctica

By JOHN LANNAN
Washington Evening Star

Dec. 2

McMURDO STATION, Antarctica — The austral summer and its 24 hours of daylight bring an annual migration of scientists, technicians and their support personnel to the frozen south at the bottom of the world.

Like the lemmings of the north, they head south in droves to steep themselves in the mysteries of austral geology, biology, glaciology, oceanography, physics, meteorology and dozens of other fields.

As flowers burst in New Zealand, South Africa, South America and Australia, the ice cliffs of the southern glaciers fall into the sea to drift off as icebergs and bare black rock and volcanic cinders absorb the sun's warmth.

Lichens and mosses bloom, adding unexpected color to remote and isolated sites.

Tiny insects, frozen through the seven-month winter, crawl from under rocks.

Penguins hop out of the sea like herring chased by mackeral and seals slide up through their breathing holes to mount the ice shelves and bask for days at a time in unaccustomed sunlight.

Antarctica is highly visible at this time of year, both figuratively and literally. Its 24-hour days, relative warmth and influx of men make it seem almost bustling as welders and jackhammers rattle round the clock and planes fly a never-ending migration of provisions and people.

Because it is the mixing bowl for a large part of the world's weather, a cold storage vault for a totally unexploited treasury of nutritious seafood and the resting place for 95 percent of the world's permanent ice, it attracts more attention every year.

It is "governed" by a treaty, nine years old yesterday, that guarantees forever the peaceful preservation of the entire continent.

The treaty — signed by the United States and 11 other nations including the Soviet Union — leaves the continent open for peaceful exploration and bars the use of any part of the vast territory for military purposes.

And the treaty is unusual from the world power balance aspect. It is the first and only time the Soviet Union has acceded to the principle of on-site inspection to ensure treaty compliance, a right the United States exercises regularly for reasons of precedent.

Antarctic scene: Penguins near McMurdo Station.

For the past several weeks, the 12 nations which signed the treaty in Washington have been meeting in Paris. Their discussions of problems, policies, programs and progress in the Antarctic have taken place in an atmosphere almost totally foreign to previous sessions.

For the first time, French Foreign Minister Michel Debre said, they "have renounced the usual sovereignty quarrels" which marred earlier meetings of the Consultative Commission.

The United States, through the National Science Foundation, conducts by far the largest Antarctic research program; approximately 200 technical or scientific personnel are there this year. Supporting them are 2,200 military personnel under Navy command, a 10-to-1 ratio.

The total annual budget for the operation is $25.5 million ($18.5 million Navy and $7 million from the NSF) relatively a drop in the bucket in this day of budgetary billions, and little affected so far by shortages of funds for scientific support.

What the money is spent on is a close look at the earth's last remaining terrestrial frontier and experience in cold climate logistic operations half a world away.

The Antarctic is as unlike the Arctic as the polar night is unlike the polar day. It is a land mass covered by 95 percent of the world's permanent ice. The Arctic is a frozen ocean.

The Antarctic is one of the world's driest deserts, despite the fact that it is buried beneath thousands of feet of compressed snow and ice. Precipitation amounts to but two to three inches a year on the plateaus.

It is the world's highest continent, averaging a mile or more over most of its face and peaking in the 16,800-foot Vinson Massif. It is essentially a flat plateau with rivers of ice — the glaciers — running off into the sea on all sides. The Arctic basin is flat.

Like the Arctic, however, the Antarctic also is one of the world's two major heat sinks, or heat absorbers. Cold air, measured as low as 127 degrees below zero by the Russians at one time, flows down the plateau to the coasts, sometimes in 200-mile-an-hour gales, chilling the oceans and the sea-level air.

Vast ice fields which alternately recede and advance with the seasons surround it out to 300 miles on all sides. Off-shore lies the Antarctic Convergence, the point at which warm oceans and warm air mix with the cold to provide the starting point for much of the Southern Hemisphere's weather.

Though the continent itself will support no life other than a few insects and some primitive lichens, and then only at certain seasons, its shoreline is alive with fish, seals, penguins and other birds and minute sea life which forms the base of their food chain.

This life chain first attracted attention to the Antarctic at the end of the last century as sealers and whalers sought their increasingly scarce prey there. Nowadays nutritionists and fishermen are interested in this vast store of protein as food for both humans and animals.

Just as this land of midday night once attracted individual explorers, adventurers, scientists and sailors in the age of heroic exploration in which the undiscovered pole itself was the lure, the continent is now a magnet for large and costly groups.

Today, however, the life and death heroics of such men as Charles Wilkes, who established the existence of a continent in 1840, Roald Amundsen, who first reached the Pole in 1911, and Robert Scott, who died in the attempt, are largely ended.

Exploration is more mundane, by air instead of dogsled. Over-all, however, the U.S. Antarctic Research Program and those of other nations still "operate on the brink of disaster."

Crashes, fires in remote stations, sickness and tenuous technological links easily broken by storms or disasters still await the unwary.

The U.S. expedition, though supplied partly by sea, maintains its connection with the world through Christchurch, New Zealand, a 2,700-mile flight over ship-less waters in venerable 14,000-hour Constellation aircraft or ski-equipped Hercules air freighters which

have logged up to 11,000 hours on bumpy runways of ice and in unbelievable flying weather.

Williams Field here is the main base. It has two runways. One is on the annual ice and drifts away each year. The other is on the Ross Ice Shelf itself and is used for ski-equipped planes only.

All of the supplies and men that move to inland stations are shipped from here — all by air. Tractors, dogs and long over-the-ice treks are a thing of the past.

For the first time last year huge C141 Starlifter jets of the Air Force Military Airlift Command landed on the ice runway.

And last week, the first commercial jet to set down here carried the Byrd Memorial Expedition — a charter flight costing $10,000 a seat — to the famed explorer's monument in the heart of this Quonset hut and canvas village.

Later when the icebreakers Glacier and Southwind batter a way through the 7-foot thick ice pack of the Ross Sea, a freighter and a tanker will follow to unload the bulk of the annual cargo.

The freighter will carry everything from food and clothing to axle-grease and playing cards.

The tanker will bring diesel oil, jet fuel and gasoline for the Constellations, wheeled or tracked vehicles and construction machinery.

Some of this will sustain this base, primarily a staging area. Most will be transshipped, fuel included, via the "Hercs." These are equipped with removable 3,600 gallon tanks which can be used to extend their range or carry fuel to other points.

Though there are some 25 or more research efforts under way here, McMurdo is primarily a military base—long on Seabees, air crews, Air Force and other military civil engineers. All are learning the tricks of the Arctic trade, a field in which the Siberia-oriented Soviet Union excels.

A crowded, dirty-looking complex of mess halls, supply dumps, vehicle tracks and—at this season—mud, McMurdo is situated in the lee of Hut Point only half a mile from the site of one of the earliest explorer's cabins.

Eleven scientists and 146 Navy men will winter here.

McMurdo shares Ross Island with the New Zealander's Scott Base, the home of the only remaining dog teams in Antarctica.

Though the dogs are only for show, the base is not. Small, functional, friendly and populated by scientific, technical and administrative staffs rather than the military, its green buildings are an outpost of colorful civilized living in a bleak, black-and-white world.

American officers, scientists and enlisted men lucky enough to have a "Kiwi"—as the New Zealanders are called—for a friend prize dinner invitations and bull sessions at Scott Base.

Overlooking both is Observation Hill, a stark volcanic cinder cone raked by gravel-seeking bulldozers. Halfway up its flank is "Nukey-Pu," the continent's man-made curiosity. It is a 1,500 kilowatt "showpiece" nuclear plant — completely inadequate and overly expensive to run.

Beside the road to Scott Base is a tank farm to hold the fuel for the generators which must supplement "Nukey-Pu," as well as contain the season's supplies for other bases.

These include Plateau Station, a phased-out operation as of last year. It will be closed this coming winter. It is 1,224 miles from here.

Then there is Hallett Station, a four-scientist summer operation 338 miles closer to New Zealand. Pole Station, 730 miles inland, has a scientific staff of six and 13 Navy personnel. It is the most decrepit of all the bases.

The big scientific base is Byrd Station, named for Adm. Richard E. Byrd, the antartic explorer. Carved out of hard packed snow, it is pleasant and comfortable despite the intense cold.

It has a winter staff of 11 scientists and 17 Navy men.

On the other side of the continent is Palmer Station, a new facility on a long arm called the Antarctic Peninsula. Closer to South America than anywhere else, it has a winter staff of eight scientists and six Navy men and is supplied by sea via Chile.

Palmer Station is also the operating base for the Research Vessel Hero, a new Yankee-style side trawler carrying 10 scientists and 10 crewmen year-round. It is 1,832 miles away.

The Hero and the USNS Eltanin, another research vessel, are the floating elements of the U.S. effort. The Eltanin operates year-round with a crew of 48 and a scientific complement of 34.

Heat Note: U.S. Chalks Up Record 122 Degrees Below In Antarctica

Washington (AP) — A new low-temperature for a United States station in Antarctica—122 degrees below zero Fahrenheit—has been chalked up while most of the United States has been experiencing a heat wave, the National Science Foundation reported July 26

The new low, recorded July 20 at the United States Plateau Station in eastern Antarctica, still is five degrees about the minus-127 degrees the Soviet Union claims was recorded at its Vostok station—also in east Antarctica—a few years ago.

The previous American low—also listed at the Plateau Station—was 121 degrees below zero. No other country having stations on the continent, except the Soviet Union, has recorded anything lower.

The National Science Foundation also reported a new record Antarctic wind velocity — 116 miles an hour—it said was recorded Thursday at the United States station at McMurdo Sound.

"And, so far as we know," a spokesman said, "that's the highest ever recorded in Antarctica by any country.

The previous high of 109 miles an hour also was listed at McMurdo.

NORWAY GIVES UP WHALING CAREER

Ends Chase After 60 Years Citing Low Prices

OSLO, Norway (Reuters)—Norway has finally withdrawn from Antarctic whaling—abandoning a 60-year-old tradition and allowing Japan and the Soviet Union to inherit her pioneer work.

Antarctic whaling shaped an entire community in Vestfold County south of here. It was a profession, a complete way of life and even a form of birth control.

Marriage and birth statistics clearly reflect the whaling seasons in ports like Sandefjord, once the "whaling capital of the world."

Most children were born in the new year and spring, and May-June was the season of marriages after long cold months in the lonely whaling grounds between October and April.

Now the last Norwegian Antarctic whaling company has announced it will send no more expeditions, ending a gradual withdrawal from a industry where more boats have for years been hunting fewer whales.

Whaling men have settled down to the regular hours of other occupations ashore. In Sandefjord, the famous whale fountain in the city center is now only a reminder and a focus for nostalgia.

Norway believes present-day whale oil prices are too low and the cost of expeditions too high to make whaling an economic proposition.

Once as many as 10,000 Norwegians went to sea after whales, but in recent years most shipowners have transferred their attention to the more profitable and stable tanker industry.

It was a Norwegian, Svend Foyn, who pioneered modern whaling, working in the late 1860's with grenade harpoons and steam-driven catchers.

The new methods made it possible to chase not only the slower species, such as sperm whales, but also the faster and stronger blue whales, fin whales and humpback whales.

Whaling in the Antarctic began in 1904, when stocks of whales were beginning to diminish in the arctic seas. In 1930 there were 41 expeditions, 30 of which were Norwegian, and catches in the early 1930's soared as high as 40,000 whales in a season.

But in 1967, Norway went only one expedition south with one factory ship, five catchers and 384 men.

Antarctica a Study in Harmony

By JOHN LANNAN

Dec. 3

McMURDO STATION, Antarctica—This is a land of parodox.

A man surrounded by ice and snow finds the air so dry his nose bleeds without apparent reason. Although the temperature may be below zero, or barely above, he walks about open-coated or in shirtsleeves.

The features that give the area the worst weather in the world also permit wooden shelters erected by the early explorers in the 1900s to remain intact despite snow and wind. Dryness keeps the wood and canvas from rotting.

Scattered about their neatly restored huts are kippers and hams, tinned tea and salt, flour and hardware, all in an excellent state of preservation. "We see no reason they won't last another 60 years," says Robin Foubister, leader of New Zealand's Scott Base and the man in charge of artifacts here.

Mountains soar from icy plateaus but most of their slopes are covered by blankets of snow thousands of feet deep. Like icebergs, only their tips, called "nunatacks," show.

This is a land protected against military force by a treaty signed nine years ago Sunday.

Today Antarctica is an example of international harmony, where Soviet planes deliver ailing Australians to American medical facilities, en route to hospitals in New Zealand.

While the rest of the world goes about its surface existence, man lives out the long inland Antarctic winters like a mole. His huts are in lighted tunnels, comfortable but primitive.

"First you learn to love it, then you get to hate it—along with everyone in it," said one recent member of a winter party here.

In a world of 24-hour daylight and 24-hour darkness, a man's sleep is upset along with his dreaming. His biological clocks forget the 24-hour day and drift onto individual "normal" frequencies, throwing him out of kilter with his companions, according to psychiatrist Jay T. Shurley of the University of Oklahoma.

As if this weren't enough to fray tempers, he travels almost exclusively in battered planes over the most dangerous terrain in the world, in unpredictable and usually savage weather.

"Main Street" at McMurdo Station with the mess hall (left) and huts.

On the long ride home, there is always the suspicion you won't really make it.

One flight engineer said, "They'll never get me to run one of those things again."

Antarctic man is totally reliant on a thin thread of seasonal supply which could break at any minute. So harsh are the temperatures and flight conditions even in summer that pilots leave engines running while unloading for fear they will not start again.

Yet man insists on living in the Antarctic. Why?

The scientist's answer is simple, says Jerry Huffman of Arlington, Va., leader of last year's U.S. Antarctic Research Program. "His answers are here. He is highly motivated, dedicated, frequently single-minded and nearly always occupied."

For the average Navy man who supports the scientists by a ratio of 10-to-1 in the summer, the answer is more complex. Although the Navy proudly claims all are volunteers, the enlisted men, mostly Seabees, smile wryly and admit that this is true but that any other choice means Vietnam.

Some have made four or five "voluntary" trips, many of them wintering-over.

For themost part, the naval personnel are overworked, overfed and incredibly bored. Their main diversions are beer and movies.

Meals are the high point of the day at all stations, and rightly so. They are generally excellent, although not all match the output of Aaron's Kosher Kitchen, presided over by Navy Cook Aaron Medow. Both Christmas turkey and kosher corned beef are dispensed with appropriate atmosphere and lively commentary.

There really are two worlds in the Antartic—one summer and the other winter. The main difference lies in the number of people and projects. Both decrease in the winter.

At inland stations, little changes seasonally but the faces, perhaps a few more summer workers and a lot more work on storing up supplies for winter. On the coast, where everything for the inland stations is "staged," masses of green-suited men in white "bunny boots" clamber off the planes for four to five months of 24-hour days and 7-day weeks.

Living in any part of Antarctica is an exercise in tolerance and adaptation. Scholarly scientists swing Seabee shovels to load snow melters and make water. Navy men who could care less about the biology of a penguin risk their necks to land scientists in isolated rookeries.

There are some frictions, although most are smoothed out by a sharing of responsibility between the station scientific leader and his military counterpart. One has the responsibility for direction and guidance, the other for carrying out the effort.

They share policymaking between them, working under guidelines established by the National Service Foundation.

All the wintering-over personnel share common barracks-room humor, pinups and movies. But the sailors generally eschew the scientists' books and Bach.

Until recently, accommodations have been primitive. McMurdo Station is a mix of new and old. The Seabees are now erecting a 66,805-square-foot building, the largest on the continent. It will open this winter, replacing quonsets and canvas.

At the inland Byrd Station, modern prefabricated huts, along with generators nad deep drilling equipment, are strung out along metal-roofed tunnels carefully cut from packed snow. Until it sinks below the point of usefulness under ever-increasing snow, Byrd probably will remain the ideal Antarctic station.

South Pole Station, a twisted, battered relic of a place left over from International Geophysical Year of 1957-1958 is also under the snow, although never designed to be. It is due to be replaced.

Soviet Union Plans to Drill Deep Into Ice of Antarctica

PARIS, Nov. 30 (Reuters) — Soviet scientists hope to learn more about the history of Antarctica in 1969 by drilling in the ice to depths of up to 3,300 feet.

A Soviet polar explorer, Yevgeny Tolstikov, a member of the Soviet delegation to a consultative conference on the Antarctic here, said the drillings would take place near Vostok, one of five Soviet bases in the Antarctic.

The Soviet Union also plans to launch meteorological rockets from the Molodezhnaya base at the end of 1969 or early 1970 and set up a large weather and radio center, he said.

The Paris conference was attended by representatives from South Africa, he United States, Australia, New Zealand, Argentina, Chile, Britain, Northern Ireland, Japan, France, Belgium, Norway and the Soviet Union.

Scientific Emphasis In Antarctica Shifts

By JOHN LANNAN

Dec. 4

BYRD STATION, Antarctica — Science was, for many years, a frequently unwelcome appendage to the whaling and sealing expeditions which opened the Antarctic. Today, it is the primary reason for being here.

Not only do the scientists want to know how the Antarctic came into being, but what can be learned from it.

For many years, the scientific exploration of the region was elementary and secondary. Even during Adm. Richard E. Byrd's explorations during the 1930s and just after World War II, it remained relatively uncomplicated.

It centered on basic geophysical measurements such as magnetic field and gravity determinations, map-making and weather, ice formations and the elementary chemistry of snow and sea water.

Today the emphasis has changed. Biology is one of the prime goals of Antarctic science. Geology is pursued in a major way. Much of the new interest stems from the International Geophysical Year of 1957-58—the IGY—when 12 nations fielded 60 different expeditions to probe the mysteries of the last remaining frontier of the earth.

One of the major expeditions of the current season is a 7-week field trip into the Transantarctic Mountain Range by four geologists led by Dr. Harold Borns of the University of Maine. The group is looking for evidence that the Antarctic was once a part of a supercontinent called Gondwanaland.

Originally proposed many years ago, the continental drift theory has recently assumed new importance. It postulates that all of the major continents were once part of a single land mass and that they drifted—under what influence no one knows—to their present sites after the supercontinen broke up.

The Maine group is looking for evidence of glacial remnants in the still exposed tips of otherwise buried mountains. This would indicate that Antarctica, as well as the other continents, was covered by ancient as well as modern glaciers.

Then by looking at the land masses of South Africa which are assumed to have once bordered Antarctica, the geologists would expect to find related ancient glacial sediments called tillites.

If so, the find would go a long way to proving or disproving the currently popular but controversial drift theory, according to Assistant Professor Bradford A. Hall, Dr. Born's associate.

By way of learning from the Antarctic, Dr. Roy Cameron of California Institute of Technology's Jet Propulsion Laboratory is looking at the continent's dry valleys with space agency funds.

He and a group from Virginia Polytechnic Institute headed by Dr. Robert Benoit are seeking the few primitive life forms found in the frozen continent—lichens, mosses, algae and two flowering plants of the liverwort family.

They hope that their research will lead to new designs for life-detection systems to be used on spacecraft headed for the moon and the near planets in the future.

One of the most dramatic efforts has been the core drilling of 7,100 feet of ice to reach bedrock beneath Byrd Station.

Taking samples from their drill head, located in a tunnel beneath the surface here, the scientists of the Army's Terrestrial Sciences Laboratory at Hanover, N.H., have compiled a frozen record of air, dust and temperature components back through eons of time.

Dr. Lyle Hansen's group reached the bottom of the hole, the Antarctic bedrock, in the Antarctic summer of 1967. This year they are going to attempt to get samples of the rock itself.

Among the early findings from the borehole is evidence that the mammoth continental ice sheet "floats" on a layer of water just a few inches thick. The compression of the ice, and the heat it creates, melt bottom ice and keep the water fluid and temperature near freezing.

This season, a team of experts on radioactive carbon-dating from the University of Berne in Switzerland have been brought in on the project in an attempt to date the samples from the hole more precisely. Some of the hard-packed ice cores stored in the Antarctic and in a warehouse near Lebanon, N. H., are known to have formed before the time of Christ.

In oceanographic research of the coasts, still other scientists from many nations have identified the source of the nutrients and oxygen which maintain life in what would otherwise be desert areas of the world's oceans.

These sources are the dense and cold oxygen-and mineral-saturated waters which flow northward along the deep ocean basin bottoms after plunging off the shelves of the Antarctic continent.

These projects are but a few of the 60 or more under way in the Antarctic under American auspices. Other nations have duplicate or complementary programs, many of them also stemming from the IGY.

If nothing else, that one year of concentrated international scientific effort gave rise to a new thrust in the cold regions. As with any good scientific effort, it raised many more questions than answers, and the United States was one of the nations which rose to the challenge of searching for the answers.

In addition to its own programs and a series of man-for-man exchanges with scientists of other nations, the U.S. is now involved in such projects as the International Weddel Sea Oceanographic Expedition with Norway and Argentina.

It also supports the New Zealand program with a common logistic chain and, in general, keeps alive the tradition of international scientific cooperation launched during the IGY.

STUDY SEEKS AGE OF ANTARCTICA ICE

3 Berne Scientists Will Join U.S. Expedition

By THOMAS J. HAMILTON
The New York Times

BERNE, Oct. 19—Three scientists from the University of Berne will leave for Washington tomorrow to join an American expedition in the first full-dress attempt to determine the age of the sheet of ice that covers the vast continent of Antarctica.

The National Science Foundation is paying the expenses of the Berne contingent, which will be led by Dr. Hans Oeschger, a professor in the Institute of Physics, who has done research at the University of California, San Diego. He will be accompanied by Barnhard Stauffer, another physicist, and Heinz Steuri of the mechanics faculty, who will assist in the collection of carbon 14 samples.

Since minute quantities of carbon 14, or radioactive carbon, are imprisoned in ice when it is formed, the expedition will try to determine the age of different layers by measuring the amount of radioactivity.

This method has long been used to help determine the age of animal and plant fossils, but its value in determining the age of ice was not discovered until the nineteen-forties. Its usefulness had been limited by the necessity of melting down large quantities of ice to obtain the necessary samples of carbon 14.

The Swiss scientists were asked to join the expedition because they have developed extremely sensitive measuring instruments that require much smaller samples of carbon 14 than have hitherto been necessary.

Dr. B. Lyle Hansen, chief of technical services at the United States Army Terrestrial Science Center at Hanover, N. H., and Dr. C. C. Langway, who conducted two earlier American surveys of ice at Thule, Greenland, will head the expedition.

It is scheduled to leave Quonset Point, R. I., for New Zealand next week and arrive at Byrd Station in western Antarctica about Nov. 3 to take advantage of the Antarctic spring.

Dr. Oeschger, who has participated in three Arctic expeditions but has never been to the Antarctic, said that it had been necessary previously to melt several hundred tons of ice to obtain the three grams of carbon 14 needed to determine the age of an ice layer.

The measuring instrument developed here requires 30 to 50 milligrams, which can be obtained in a gaseous state by melting three to five tons of ice, he said.

The Swiss physicists are also supplying a specially designed probe that will be lowered into a test hole at Byrd Station to collect and melt samples from each layer of ice to be tested. The probe is about 22 feet long and three feet in diameter and resembles the containers in the pneumatic tube delivery systems used in department stores.

It contains special features to prevent contamination of the samples and to permit the discharge of the melted ice outside the bore hole.

'Polar Big Eye' Pretty Hard to Close

By JOHN LANNAN

Dec. 5

POLE STATION, Antarctica — When a man winters-over here during the long polar night, he can almost forget about colds, viruses and flu once the antarctic sun sets. It's the "Polar Big Eye" that he can't ignore.

This is a form of galloping insomnia that spreads through Antarctic stations like measles in a grammar school. It leaves a man red-eyed, cantakerous and dead-tired.

Unlike respiratory and gastric diseases that die out of their own accord soon after the last of the visitors leaves the icy continent, Polar Big Eye is not the result of a bacteria or a virus. It appears to have several causes.

But insomnia, the inability to sleep, is not the only nocturnal problem of the hardy souls who winter over. They also appear to dream less and because there is a large school of psychiatric opinion which holds that dreaming is a biological necessity, a team of researchers from Oklahoma has been looking into these related problems.

Dr. Jay T. Shurley, career researcher at the University of Oklahoma, has been studying the sleep question for the last two years. He has finished his research with human beings and is now looking at seals to see how they handle the problem — if any.

Polar Big Eye and the dreaming problems are related.

When a man can't sleep, he can't dream and if he can't dream, says Dr. Shurley, then his brain can't rid itself of the extraneous information it stores up every day.

The result? No one really knows. Some, however, think that a lack of dreaming could lead to neuroses, perhaps outright psychoses.

In 1967, more than 90 percent of the men who wintered over here sought medical aid for attacks of Polar Big Eye which cropped up every 28 to 33 days. Last winter, only 65 to 70 percent sought help.

To date, no one knows what causes Polar Big Eye. Dr. Shurley believes there may be three factors: high altitude, a lack of synchrony in the subtle biological clocks which pace a human's innermost processes, and what he calls "survival anxiety," the unconscious fear that the man will not live to see the end of the vicious black winter.

—Star Staff

Dr. Jay T. Shurley asks men about their dreams at the Quonset hut in Antarctica.

Whatever the reason, "it strikes in epidemic proportions," he said, "and it happens every year."

The Oklahoma psychiatrist has now looked at the individual sleep patterns of 20 men carefully chosen from among two wintering-over crews.

Dr. Shurley believes his final results — now a year or more away — probably will have significant impact on the choice of future winter-over parties and may well be applicable to the selection of astronauts for long space missions or submariners for lengthy voyages.

They could also give some clues to facilitating adaptation of the human being to new and isolated environments.

The reason is that quality and quantity of sleep is an indicator of emotional adjustment to things like isolation, loneliness, cold and interaction with a limited number in a closed community.

In the Pole experiments, each man's sleep was analyzed for three nights before he got here. This was to provide a standard sleep pattern for that individual.

Each one was, or will be, retested within two to 12 months of the time he returns home to see if there are any after-effects of polar life.

While here, the men were tested six times; two sessions shortly after arrival, two more at midwinter and the last two in the spring.

Technician Robert E. Brooks of Willisville, Va., took heart, respiration, brain wave, eye movement, muscle tension and skin measurements at each session. During periods of rapid eye movement, the period called "REM" (dreaming) sleep, he woke the subjects to tape their recollections.

Brooks' records indicate the amount of REM sleep—and consequently dreaming—changes drastically at the Pole. The two subject groups averaged 23 percent of their sleep time in the REM state at Quonset—but only 17 to 18 percent in midwinter at the Pole.

By spring, the REM periods had stretched out to 28 percent of sleep time, and after the return home returned to normal.

Like many others, Dr. Shurley believes the enhanced electrical activity of the brain during REM sleep — sometimes even in excess of that during periods of wakefulness — is an indication of a "dumping process."

"If you assume the brain is like a computer," he said, "you have to have a programming hypothesis. The brain has to clear itself of unused and useless information. It relieves itself in REM sleep. Millions of bits of information stored in its short-term memory are disgorged."

Lack of sleep in the form of the Polar Big Eye which appears every 28 to 33 days seems to be a physiological effect related to the body's inability to keep its internal clocks synchronized without the usual time reference of the sun. Insomnia has long been linked to life in high latitudes and Dr. Shurley feels its real importance may lie in interference with REM activity.

The psychiatrist said he believes reduced REM sleep "correlates with on-going sensory monitoring as you move into winter. There just isn't much data to be processed, therefore not much to be discarded. As you approach the end of winter, there is a good deal of anticipatory processing as you look forward to being relieved."

REM sleep, he insists, "is a biological necessity" for all but birds and reptiles.

During the last few weeks Dr. Shurley has started observing the REM sleep of Weddell seals as they lie about, apparently somnolent, for days at a time in the unaccustomed sunlight of the austral summer.

His work will complement that of Drs. Gerald Kooyman and Robert Elsner, both of Scripps Institute of Oceanography. They are already working with captured seals on the Ross Sea ice near McMurdo Station.

The scientists cut a hole sufficiently far from any other breathing spot to assure that the seal would return again and again. The readings they take each time she dives could apply to man's deep-diving problems in projects such as Sealab 3.

Hardiest Tourists Now Try Antarctica

By JOHN LANNAN

Dec. 6

McMURDO SOUND, Antarctica — Tired of those same old wintertime vacations in the sunny south? Try something really south — like Antarctica.

This dangerous, ice-covered continent, long a paradise for the adventurer and the scientist, is becoming something of a mecca for the hardiest of tourists.

This is all part of the change in Antarctica. Far more important are the developments in commercial and scientific ventures.

It may be about as "out of the way" as any place on earth, but Anartica is drawing increasing numbers of tourists every year. Even so, only a couple of hundred are making the trip this year. And that's a record.

One New York travel agency will start its eighth Antarctic tour Jan. 11. This is the fourth year it has run such trips.

More than 100 persons will be on board (cost: $2,800 to $5,200 a head). And there's a waiting list for more trips.

The tourist ships run to McMurdo Sound, where one of them got hung up on a shoal for three days and to the Antarctic Peninsula, where the same ship moved through volcano-heated waters hot enough to burn a man's hand.

The agency masterminding these trips is Lindblad Travel, Inc., of New York.

According to Lars-Eric Lindblad, the expedition leader, his agency scored a real "first" a couple years ago: The Argentine Navy provided the ship for the long, cold voyage — the first time a navy has chartered a ship to tourists.

This year, the Chilean Navy got the idea and leased to the firm the M-V Aquiles, a 2,600-ton former Danish ferry especially constructed to handle ice.

With the advent of an all-new passenger ship especially designed for use in the Artic north next year, Lindblad plans an even bigger excursion program for the south.

This year's tour will, if all goes well, cross the Antarctic second time a tour has done this.

The tour also will include the Falkland Islands, the Palmer Peninsula, site of the U.S. base, and a good many other prime sites for amateur naturalists and conservationists aboard.

Lindblad also hopes to put passengers ashore on Deception Island, the volcanic site where no one could land last year because of eruptions.

There will be no stops here at McMurdo until next year.

However, the first commercial jet ever to land on the ice runway here arrived Nov. 22 with 60 passengers on a Byrd Memorial Flight. The aircraft was serviced by the U.S. Navy after its 2,700-mile trip from Christchurch, New Zealand, and dispatched over the Pole to South America after a brief service for the passengers at Adm. Richard E. Byrd's memorial.

But exploiting Antarctica for tourists' money is only one form of expanding exploitation of the continent.

Antarctica is ripe for commercial exploitation,

Dr. Albert Crary, deputy director of environmental sciences for the National Science Foundation, sees the Palmer Peninsula as the most likely place for man.

"Contrary to what people think, it's up above freezing there during every month of the year. There are big possibilities for a major base there, say for harvesting krill (a shrimplike whale food). The Russians have looked into this," Dr. Crary said.

This is an area early sealers and whalers frequented regularly, leaving only when they had so depleted the stock that there was no longer any reason to remain.

"The real potential (of Antarctica) is in the marine area," Crary added, "the krill congregate so that you can scoop them up tons at a time, just as the whales did. There's a possibility of making a major harvest, even processing them here (for fish meal) without making any inroads on the whales, which are now making a slow comeback."

But despite the potential for economic exploitation of Antarctica — a land which was once tropical or subtropical and which therefore holds the promise of oil as well as the coal already found — science is still the main attraction and the main industry.

"However, we've reached sort of a turning point in our work," says the NSF's Crary.

"As I look back over the past 10 years it's been sort of a monotonous occupation as far as the scientist is concerned.

"The things we are planning to do in the future are much more exciting."

He talks of deep drilling projects, not through ice, as has been the case until now, but below it, into the bedrock of the high interior plateau. And satellites which will receive information from remote, unmanned weather and geophysical stations are also in the early planning stage.

Other spacecraft which will straddle the electro-magnetic field lines of force which stretch from pole to pole are being considered. So, too, are expanded biology programs, mapping efforts in untouched areas like Alexander Island and studies of the Antarctic core to see how much water was actually stored there in the ages of the great glaciers.

Already, the scientists are making use of new equipment which permits them to map the ice and snow cover and the hard rock lying thousands of feet beneath its surface, all electronically and from the air.

What's missing, according to Jerry Huffman, the U.S. Antartic Research Program's resident director here last season, are sophisticated but presently available navigation systems.

Without these locating devices, he says, aerial terrain mapping is totally inadequate. But there is no money to pay for them, even assuming the Defense Department would make them available.

His successor, Kenneth Moulton, admitted that "budgetary problems are holding us up." And Dr. Crary pointed out that the NSF's Antarctic program could well spend up to $10 million rather than the present $7 million without taxing the Navy's separately funded support capability.

The total cost of the program, Navy and NSF, is $27.5 million this year — the price of one reasonably sophisticated unmanned spacecraft.

However, both Huffman and Moulton, the men on the scene, agree that a good deal of shifting about could be done within the framework of the present budget level, enough to maintain the rate of change Crary says is under way.

Neither realistically looks for any great expansion in the program, nor any real need in the light of the Navy's limited support capability. But, said Huffman, "we will soon be getting into a lot more sophisticated programs. I think most of this can be done within present budgetary limitations."

Unstated but implicit was the implication that it could be done better and far more efficiently with very few more dollars.

U.S. EXPERTS COLLECT OCEAN DATA FOR MAP

SUITLAND, Md. — Scientists from the United States Naval Oceanographic Office are assisting the International Hydrographic Bureau by collecting depth measurements that reveal the contour of the ocean floor.

These depth measurements, taken in Pacific and Atlantic Ocean areas that extend 2,000 miles off the coast of North and Central America, and combined with those collected by the United States Coast and Geodetic Survey, will represent the American contribution to a scientific chart being prepared by the International Hydrographic Bureau to show the topography of the world's oceans.

The chart, entitled "General Bathymetric Chart of the Ocean," will be composed of 24 full color sheets. Sixteen sheets will provide coverage between the Arctic and Antarctic circles at a scale of 1:10 million (approximately 130 miles equal 1 inch) and eight sheets at a scale of 1:3.1 million (approximately 40 miles equal 1 inch) will cover the two polar areas.

The International Hydrographic Bureau, composed of 42 nations, coordinates the work of hydrographic (ocean charting and mapping) agencies in its effort to produce accurate navigation and scientific charts for mariners and scientists of all nations.

Glacier Named for Scientist

WASHINGTON, Nov. 28 (Reuters) — Prof. E. Everett MacNamara, of Lehigh University in Allentown, Pa., has had an Antarctic glacier named after him, the United States Board of Geographic Names announced today. Professor MacNamara was the first American scientist to work in Enderby Land on the frozen continent.

Navy Lab Melts South Pole Ice That Was Snow in Time of Christ

By Peter Winterble
Washington Post

ANNAPOLIS, July 10—A column of ice that first fell as snow on Antarctica at the time Christ walked the Holy Land was melted in a Naval Academy laboratory here today.

The ice, pulled from 850 feet below Byrd Station as part of a drilling operation, melted and dripped slowly into a large beaker in Maury Hall as Rear Adm. James W. Kelly, chief of Navy chaplains, said a prayer:

"Lord, we are grateful today for all you have given us . . . as we watch the melting of snow that fell the year our Lord was born. We know that was a joyful year."

Rear Adm. James L. Abbot, chief of the Navy Task force that supports the National Science Foundation work at the South Pole, explained how the ice was extracted in an experimental drilling operation to probe the ice cap's depth and composition. Abbot asked that 15 feet of the round boring be brought to Annapolis to be melted and distributed.

By counting layers of ice formed during summer thaws and by radiation measuring methods, Abbot said, scientists determined that one of the tiny layers in the 15-foot core was formed the year Christ was born.

Dr. T. O. Jones, an Antarctic scientist, said the method was accurate enough to determine that "this ice was fresh falling snow from the heavens during the years Christ was living on this earth."

The ice was transported from the Antarctic to Baltimore aboard the U.S. Coast Guard icebreaker Westwind, and brought here by car, still frozen and in three 5-foot sections.

By Harry Naltchayan—The Washington Post

Rear Adms. Kelly (left) and Abbot close eyes in prayer as ice from time of Christ is ceremoniously melted.

Drilling through the ice cap at Byrd Station began in 1966. Last January a drill broke through the ice and struck bedrock at 7100 feet below the Station, which is 5000 feet above sea level—thus indicating that the ice cap extends at least 2100 feet below sea level.

Other ice samples from about 4500 feet below Byrd Station show traces of volcanic ash and are estimated to be more than 10,000 years old, scientists say.

The water from today's melting will be distributed to "a small number" of persons and institutions, Abbot said.

Adm. Kelly hopes to send a vial of it to the Vatican, while another portion will be kept at the Academy Chapel.

"We also hope to mix some of this water with the water from the Seven Seas in which the third-year midshipmen will dip their new class rings during the traditonal ring dance next spring," Abbot said.

The water, he said, would add "a religious significance" to the nautical and academic tradition of the dipping of rings.

50-BELOW—A DANGER POINT

POINT BARROW, Alaska — The rule in Arctic DEW Line stations is that no man goes out alone at 50 below zero or lower.

Conversion of Ship Marks the Decline Of Whaling Fleets

The conversion of the whale factory ship Thorshovdi into a drilling ship is a reminder of how rapidly Europe's whaling fleet has declined, the Fairplay International Shipping Journal reports.

Only two Antarctic factory ships are owned by Europeans, the Scandinavian Koskos IV and the Thorshavet, all others being Japanese or Russian. The Soviet Union is believed to have four and the Japanese 10.

Whaling entered a new phase after the 1923-24 season, during which Capt. C. A. Larsen took the then newly converted Sir James Clark Ross, formerly the Mahronda, to fresh grounds in the Ross Sea, and there found whales in profusion.

For her time and type, that ship of 8,244 tons, was large and reasonably well equipped. But far more typical of that period was the Norwegian Ready. Built in 1897 as the Castle Line's Raglan Castle, the Ready had seen service as a Russian supply ship, and then was owned by the East Asiatic and Donaldson Lines before starting her whaling career in 1911.

The first sternramp whaling ship appeared in 1925, the 7,866-ton Lancing, a former British cargo vessel. From then on expansion of whaling fleets was rapid, and many ships were bought by Norwegians for conversion to whaling.

In all, about 40 converted whaling steamers, large and small, were in service during the 1920's and 1930's. The first factory ship to be designed as such was the Vikingen of 12,639 tons. New and larger factory ships were built in the thirties. But losses of these vessels were heavy during World War II.

After the war, priority was given to the construction of whaleships in Euripe, with the series ending in 1955 with construction of the Willem Barendsz of 24,570 tons. Since then, the Japanese fleet has been built by purchase of ships, rather than original construction.

32 SEALS IN STOMACH

ST. PAUL, Pribilof Islands—The stomach of a killer whale captured in this island group contained 32 full-grown seals. The animal, also called an orca, may be up to 30 feet long.

Observing Earth's Surface

By DR. I. M. LEVITT
Director, the Fels Planetarium, Franklin Institute, Phila.

Newark News

Science suffered a $50 million blow when Nimbus B was destroyed due to a malfunction of the launch system. This event also meant a tremendous loss in potential programs for scrutinizing the earth's surface features.

Scientists have learned in recent years that these weather satellites are capable of providing non-meteorological data which can be vital to the study of the physical characteristics and changing patterns on the earth's surface. Cloud-cover pictures, in addition to providing meteorological information, also disclose large areas of water, land, vegetation, snow and ice. The scientific, economic and operational applications of this data inevitably have a tremendous future impact.

From the earth or even from high-flying aircraft, one "cannot see the forest for the trees" —one cannot see surface features because he is too close to them. But satellites with picture-taking capabilities have suddenly made visible surface features of vital concern to scientists in many disciplines.

As a result of pictures taken by previous Nimbus satellites, changes were incorporated in the geographical revision of a scale model of the Antarctic continent. In this updating, Mt. Siple was found to be two degrees from the position found on existing maps. This coastal 10,000-foot mountain, often used as a location or orientation point, was thus "relocated" 50 miles to the west.

Nimbus I pictures also indicated only one mountain group in the Kohler Range area instead of two. The explanation for this discrepancy is that the same mountain range was sighted and differently positioned by two expeditions. The positions by one group were in error and, thus, Antarctica maps circulated today still indicate two mountain groups.

Even the ice-front information for this frozen continent has been changed and updated. The areas which were reconfigured were the Filchner ice shelf, Weddell Sea and Princes Martha Coast.

PHOTO SURVEY of Antarctica by Nimbus satellite detected errors in existing maps.

The Canadian government-sponsored Project Nairec (Nimbus Arctic Ice Reconnaissance) used picture data from Nimbus I to learn how pictorial information received in "real time" could be used in the Arctic ice-forecast system. The pictures of Frobisher Bay, Northwest Territories, were exploited for extracting ice infomation. Cloud configurations and geographical detail appeared well defined. On three of the pictures, sea ice was discernible, agreeing in position with the ice information available. Had ice been present in significant quantities, scientists could have mapped and identified it on the pictures.

One Canadian photointerpreter was able to discern extensive underwater shoals (visible as light areas) in the James Bay region surrounding the curious, semicircular Akimiski Island.

Ice May Have Cooled World, But It Heats Up Scientists

PRINCETON — 100,000 years ago there may have been a violent and massive movement of Antarctic ice that raised sea levels everywhere by 50 feet, and cooled off the world.

Today Princeton University teams of geologists on both sides of the Atlantic are seeking evidence to determine if that scientific theory is valid.

The scientists are searching the geological record hidden in sediments laid down 100,000 years ago, for evidence of previous rapid rises of sea level.

One team is studying sediments down in the banks of the Shark River near Neptune City, while the other group is at the ancient estuary of the Thames River in London.

If evidence for large scale surges of ice can be found, the scientists warn, "there is no reason to believe they may not recur in the future."

Bodies of ice, such as in the Antarctic, move only a few feet a day. But when a large scale surge occurs the ice spreads forward like molasses from a jar, and distances of over 100 yards may be covered in a day.

The scientists are seeking the evidence by pounding an 8-foot hollow, plastic tube in the banks, and withdrawing undisturbed samples of silt and mud layers deposited in the past.

These sediments are then studied in laboratories to determine any changes of water and vegetation, which could provide clues to previous geological alterations.

Whatever the outcome of their findings, the Princeton scienists observed that if similar large surges occur today in the present Antarctic ice sheet over a period of weeks, months or years, "the results would be catastrophic by any human scale."

Prof. Sheldon Judson explained that although surges have never been observed in the Antarctic, the mechanism believed to cause the huge movements may have recently been discovered there.

Scientists believe, Prof. Judson explained, a surge occurs when part of the ice mass near the earth melts and provides a water "cushion" on which the ice may slide forward.

The melting of the bottom ice is believed caused by pressure of the ice above—by friction as the glacier inches along.

The professor said a research effort in the Antarctic earlier this year successfully drilled to the bottom of the continental ice gap, a mile and a half beneath the surface.

There they found water.

2 Copters Lift Soviet Crew Wrecked on Reef in Arctic

Dispatch of The Times, London

MOSCOW—All members of the crew of a Soviet survey ship were rescued after a two-day ordeal when they were wrecked on a reef in the Arctic Ocean.

The small vessel was held fast on an underwater rock it had hit during a gale in the East Siberian Sea.

Lying on its side in heavy seas 120 feet from the uninhabited island of Vilkitsky, the craft was severly battered. The rescue was accomplished by two helicopters, which lifted 30 members of the crew to safety.

SCIENTIST WANTS POLAR PRESERVES

Fears Nations May Intrude on Antarctic Wildlife

ANN ARBOR, Mich.—Antarctica remains a frozen wilderness, but international cooperation is urgently needed to preserve selected areas, according to a University of Michigan ecologist.

William S. Benninghoff, professor of botany at the university, recently returned from a month's visit to the coldest continent on earth.

Professor Benninghoff is chairman of the panel on biological and medical sciences for the committee on polar research in the National Academy of Sciences. This panel of six experts keeps a watch on federally supported polar biological and medical research projects.

The purpose of the visit was to gather information before advising the National Science Foundation on future polar research programs.

"One object of the visit was to evaluate prospects for establishing selected sites as uncontaminated areas not to be entered by people or crossed by low flying aircraft," the professor said.

Some areas of the icecap are still devoid of life, except for widely scattered microbes in resting phases.

"These areas may one day be of great value for biological experimentation that requires a germ-free environment," Professor Benninghoff said.

He inspected three protected areas—Cape Crozier, Baufort Island and Cape Hallett—to assume himself that all possible protective measures were being carried out for the conservation of animal life. These locations were set aside as wilderness areas by international agreement.

Professor Benninghoff found that the areas were still not dangerously disturbed by man. Cape Hallett, an International Geophysical Year station, was constructed in the midst of a penguin rookery, but because of the careful maintenance of the station area by the United States Navy, the penguins were little affected.

According to Professor Benninghoff, all unnecessary equipment had been removed from the site and the penguins were breeding at essentially the same level as before.

There are several dry valleys in Victorialand that should be preserved, he said. They are within 80 to 150 miles from McMurdo Base on the Ross Sea. These unique valleys contain micro-organisms — yeasts, bacteria and protozoa—that have been found nowhere else on earth.

The professor suggested that the valleys be set aside to allow scientists time to study the biological systems before they are contaminated by the activities of man. These organisms are able to exist in a wide range of temperatures and salt concentrations.

The seas around Antarctica are becoming recognized as a leading potential source for food production. In those seas, nutrient-rich water rises after being carried southward from the tropics by deep ocean currents.

The Antarctic water is rich in plankton, fish and marine mammals. Professor Benninghoff called for conservation of these resources now, before other countries entered these waters with their efficient factory fishing ships and reduced the fish populations to dangerously low levels.

Some agreement on the use of the Antarctic has been reached by the 12 member nations of the Artarctic Treaty. In 1959, an agreement was drafted to exclude the cold continent from military use and to direct interest there toward research.

More recently, the National Academy of Science agreed with others of the treaty nations on a set of conservation measures to preserve the animal life. No animals may be taken from the Antarctic without special permission, and those animals that are taken must be reported to the takers' respective national committees. In addition, 12 areas were set aside as sanctuaries to be kept free of human interference.

Antarctica is covered by a great icecap except for a narrow fringe of exposed rock surfaces.

"Cushions of mosses and lichens and webs and scums of algae and fungi are the only plants on this border," Professor Benninghoff said.

Higher animals exist at certain points along the coast. Great colonies of seals live on the ice shelf and adjacent pack ice, and along the coasts penguins and other birds come from the sea to breed.

Alaska Has One Railroad

The only railroad in Alaska is the Alaska Railroad, a 480-mile line between Seward and Fairbanks, The Associated Press notes.

Argentine women don parkas for research in Antarctic

The Christian Science Monitor

Buenos Aires

Representing the first feminine advance into the Antarctic, four Argentine women scientists now are in the deep south, far below Cape Horn, studying marine fauna under and above the ice.

The four are professors—or profesoras in Spanish—in the Argentine Naval Hydrographic Service. Their names—Irene Bernasconi, María Adela Caría, Elena Martínez Fontes, and Carmen Pujals—probably will go down in national history for this is not a publicity venture. It is a serious scientific mission being made by women who have spent at least 20 and as much as 40 years in laboratory work. Each has international experience and honors.

Annual expedition

"It won't be science all the time, of course," remarked Elena Martínez, before departure. "We're taking some books and music—records—with us, to enjoy between the mollusks and the sea weeds," she quipped.

Most of their research work will be done around an island in the Palmer archipelago, with the Goyena survey ship at their disposal.

The expedition, an annual one, is organized by the head of the naval hydrographic department, Capt. Jorge Ledesma, with the cooperation of the Bernardino Rivadavia Museum of Natural Sciences.

In charge is Argentina's leading ichthyologist, Prof. Norberto Bellisio. Each year, up to now, he has taken American or European specialists with him. This time—from November to March, the "summer" season in the Antarctic—he decided to take his own distinguished countrywomen into the ocean field.

Their technical equipment was readily obtainable. It included special American-designed nets for deep sea catching and microscopes for starfish.

There was one snag. No women's clothing was available for the Antarctic. Local suppliers had never heard of any being manufactured.

So the four had to make do with men's styles. They looked chic enough as they quickly tried on their skins and furs before leaving Buenos Aires during a heat wave.

HAMS RELAY PHOTOS TO ANTARCTIC CREWS

LONG BEACH, Calif. (AP)—Three ham radio operators have found a way to cheer Navy men stationed near the South Pole. They are sending the sailors radiophotos of their families.

One of the three, Earl Darnell, says:

"It was a high point in my life to be able to get any kind of a picture down there. It's been a great morale booster for the men and a lot of fun for us."

After six months of experimenting with commercial gear and borrowed Navy equipment, the three operators made their first successful transmission. Now they are sending new pictures at every opportunity.

The base at Antarctica's McMurdo Sound, where 700 men are participating in Operation Deep Freeze, receives the pictures on its weather map facsimile machine.

Ralph Sternberg, another member of the group, says: "The communications officer tells us that the men are tickled to death, and say keep the pictures coming."

Now the hams will try sending front pages of home town newspapers, plus shots of beauty queens in swimsuits.

1871 ARCTIC DEATH TRACED TO POISON

Arsenic Reported Found in Tests on Explorer's Body

By RICHARD D. LYONS
The New York Times

An American explorer who died 97 years ago in Greenland while heading a federally financed expedition was poisoned while trying to reach the North Pole, a Dartmouth College professor said Dec. 30.

Dr. Chauncey Loomis Jr., a professor of English who is a historian on the Arctic, said the explorer, Charles Francis Hall, had ingested "tremendous amounts of arsenic" two weeks before his death in 1871.

The reason for Hall's mysterious death, which had been hinted at over the years by historians and other explorers, was established after Hall's grave in Greenland was opened last summer, samples of tissue were removed and examinations were performed in scientific laboratories in the United States and Canada.

Dr. Franklin Paddock, a physician of Lenox, Mass., who accompanied Dr. Loomis to Greenland, said the tests had shown that Hall's hair, nails and bone contained "tremendous doses of arsenic in the last two weeks of his life."

Dr. Paddock and Dr. Loomis said in telephone interviews that there was no doubt in either of their minds that "Hall was poisoned and almost certainly was murdered."

Dr. Loomis noted that records on file in the Smithsonian Institution in Washington showed that shortly before his death, Hall had violent arguments with Sydney Budington, the master of the converted Navy ship Polaris that carried the party, and Dr. Emil Bessels, the chief of the expedition's scientific staff.

Winter was closing in on the Arctic, Dr. Loomis said, and Budington and Bessels wanted to head south for safer waters.

Hall, a native of Vermont, was something of an eccentric. He started a seal engraving business in Cincinnati and later founded two small newspapers. In the eighteen-fifties he developed a sudden enthusiasm for the Arctic and twice traveled to Greenland to winter with the Eskimos, using his own money.

After the second trip Hall delivered lectures to raise money for a third venture. Among those who heard him speak was President Grant, who was fascinated by Hall's accounts of his Arctic adventures.

"Grant wanted the United States to be the first nation to reach the North Pole," Dr. Loomis said. "The feeling then was not unlike that which prevails today about landing on the moon."

Hall received a grant of $50,000 from Congress and a small ship formerly belonging to the Navy for a third trip north, which left from Brooklyn on June 29, 1871. But Hall found the South Sound route to the Arctic Sea blocked with ice and he was forced to turn 30 miles south for the winter.

The Polaris put in for the winter at Thank God Bay, named by Hall, on the northwest coast of Greenland about 500 miles south of the pole. It was there, according to Dr. Loomis, that Hall quarreled with Budington and Bessels over their desire to head farther south.

"Hall was violently sick for two weeks before he died," Dr. Loomis said. "All the time, according to witnesses, he kept saying he was being poisoned."

The 30 other members of the expedition, after burying their leader, headed south, split into two groups, and were rescued months later. Dr. Loomis said a Navy Department investigation of Hall's death concluded that he had died naturally.

The existence of arsenic in Hall's tissues was determined at the Toronto Center for Forensic Sciences using a recently developed process known as neutron activation analysis. A sample of tissue is bombarded with neutrons inside an atomic reactor. The atoms of the elements in the sample then emit radiation in patterns characteristic of the elements in the sample..

"The tests on fingernails and hair were our only remaining hope of proving anything about Hall's death," Dr. Paddock said, "and results of those tests point to only one conclusion: Hall was poisoned."

Gas Losses From Atmosphere Linked to Winds From 2 Poles

By JOHN NOBLE WILFORD
The New York Times

WASHINGTON, Sept. 11 — The earth appears to be leaving a trail of slow-leaking helium and other gases as it moves through space.

According to a new theory advanced at a scientific meeting here today, the gases seem to be escaping the atmosphere at the two poles through gaps in the earth's magnetic field. They, therefore, constitute, what is being called the polar wind.

The invisible polar wind, scientists said, appears to travel at a velocity of 6 to 12 miles a second, slow compared with the charged particles flowing from the sun as solar wind.

Scientists said the loss of helium and smaller amounts of hydrogen and oxygen posed no problem of diminishing vital gases, since the earth keeps replenishing the supply. It has long been assumed that small amounts of helium escape the earth's atmosphere, but the avenue of escape was not known.

The polar wind theory was described by scientists as the most interesting idea to come out of the nine-day international symposium on the physics of the magnetosphere.

The meeting, attended by 319 scientists from a half-dozen countries, including the Soviet Union, is sponsored by the National Academy of Sciences and the space agency's Goddard Space Flight Center.

The meeting, which ends Friday, was called to review recent research developments concerning the magnetosphere — the outer reaches of the earth's atmosphere that, through the influence of earth's magnetic field, consists of trapped radiation particles.

In describing the polar wind theory at a news conference, Dr. W. Ian Axford of the University of California at San Diego said it "could account for many strange phenomena."

Dr. Axford said the theory could explain why the ionosphere above the polar regions is less dense than elsewhere, for the wind may be sweeping it relatively clear of particles. The ionosphere is the region in the upper atmosphere ranging from 50 to 200 miles in altitude.

In addition, the theory could explain why the amount of helium in the atmosphere remains constant despite the continuous emissions of the gas from the earth's crust, Dr. Axford said.

The theory was presented to the symposium in a paper prepared by Peter M. Banks and Thomas E. Holzer, also of the University of California at San Diego.

They conceded that much research was needed to prove the theory's validity. But scientists at the Goddard Space Flight Center reported that Explorer satellites passing over the poles have detected strong upmoving gases.

In another report, Dr. Donald J. Williams of Goddard said that the radiation from an American nuclear test in the upper atmosphere in 1962—the Starfish experiment—has only recently decayed enough for scientists to resume investigation of naturally occurring radiation in that region.

ANTARCTICA VISITED BY SON OF ENVOY, 12

CANBERRA, Australia (UPI) —"Well, it's very difficult to express in words what it was like down there," the slim, bespectacled Texan drawled on his return from his first trip to the South Pole.

"It was certainly a wonderful experience, though I don't know whether I'd like to go back, at least not yet awhile."

It is not much wonder the traveler had some difficulty in finding the right words. Speaking was Bill Crook Jr., 12-year-old son of the United States Ambassador to Australia.

Bill is the youngest person ever to go to the South Pole. The boy, his father, William H. Crook, and a small party of Australian and American officials spent eight days in Antarctica.

Bill explained that the "biggest thrill" was seeing Antarctica for the first time. But it was not what he expected.

"I didn't expect to see any ground," he said. "I expected it all to be ice and snow. But there were a lot of rocks and ground sticking through the snow."

Antarctic Expedition Finds Molten Lava in Mt. Erebus

ANN ARBOR, Mich. (UPI)— Scientists have found molten lava in a vent on the top of misty Mount Erebus in the frozen wastes of Antarctica.

A research team from the University of Michigan, using infrared camera techniques, has made a two-day aerial survey of the region.

The scientists said a study of films made over Mount Erebus had revealed molten lava in the throat of its summit crater. However, they said that there was no active volcano as such in the region.

Peak Named for Biochemist

DAVIS, Calif.—A mountain peak in Antarctica has been named for Dr. Robert E. Feeney, a biochemist at the University of California at Davis, in recognition of his research contributions in Antarctica.

Japanese Team of 11 Reaches South Pole

The Japan Times
Dec. 20

An 11-member Antarctic observation team of Japan Thursday reached the geographical South Pole after an 82-day, 2,570-kilometer trip from Japan's Showa Base on Ongul Island in the Antarctic.

This was revealed in a message received by the Japanese Antarctic Research Expedition Headquarters in the Education Ministry from the wintering team.

The message, sent by Masami Murayama, leader of the team, said the group arrived at the U.S. Amundsen-Scott Station, located at the geographical South Pole at 11 a.m.

The message noted that the Japanese hope to reach the pole was realized 56 years after the first Japanese group set foot on Antarctica and thanked the Japanese people for their interest and cooperation.

Murayama expressed gratitude to the American Antarctic team for its assistance and efforts of the previous wintering team that had set up stockpiles of materials on the route to the pole.

Prime Minister Eisaku Sato sent a congratulatory cable to Murayama upon learning that his team had reached the pole.

In the message, Sato said that he shared with the whole Japanese people the joyful feeling at the news of the successful trip to the pole and hoped that the team would make the return trip safely.

A team led by Lt. Naoshi Shirase of the Imperial Japanese Army succeeded in reaching a point 80.05 degrees S. latitude on Jan. 28, 1912 on dogsleds from the Ross Sea.

The current expedition, originally made up of 12 members, left Showa Base on Sept. 28 on four snowcars.

On Oct 3, however, one of the expedition members was injured by an ice drill. He was forced to return to Showa Base.

The remaining 11 members continued their trip to the pole, which was one of the big undertakings of the current ninth wintering team.

The Japanese team was the eighth expedition to succeed in making an overland trek to the South Pole. It was first visited in December 1911 by a Norwegian expedition, led by Roald Amundsen.

Murayama and other members of his team are scheduled to leave the South Pole on its return trip to Showa Base around Dec. 24 after a five-day rest at the Amundsen-Scott Station.

The 2,570-kilometer overland trip was the longest one-way trek to be made by an expedition to the Antarctic region.

During their trip to the pole, the expedition members engaged in various observation work involving weather, topography and geology despite adverse conditions.

Much interest has been shown by various countries concerned in the Japanese expedition since the route taken by the team covers areas which have not been explored so much in the past.

The Japanese polar exploratory team will leave the South Pole on Christmas Eve on a return trip to Showa Base on Ongul Island.

All Members Said In Good Health

Mainichi Daily News
Dec. 20

Masayoshi Murayama, leader of Japan's polar exploration party which arrived at the South Pole at 11 a.m. Thursday JST, said in a message that all members of the team were in excellent health.

In the message received by the promoting headquarters of the Japanese Antarctic Research Expedition in Tokyo shortly after 2 p.m. the same day, Murayama said the South Pole was a point which not only Japan's Antarctic expeditionary team desired to reach but those of most other countries as well.

He said it took about 50 years for Japan to raise the national flag at the pole since its first attempt.

He said he would like to express his heartfelt gratitude for the interest and cooperation in the project by the people of Japan.

He said it was equally fortunate that the party could not only reach the South Pole but attain fine results in its observations and investigations of the white continent along the way.

He said the Pleateau Base of the U.S. was so ideally located midway between the Showa Base and the pole that it served effectively as a fuel supply station.

Members of Japan's first Antarctic expedition team to reach the South Pole are shown in a photo taken at the Showa Base last February. Leader Murayama stands in the center foreground.

Russians to Launch Rockets To Study Upper Atmosphere

PARIS, Nov. 18 (Reuters)—The Soviet Union is planning to fire rockets to study the upper atmosphere next year from its Molodezhnaya base in the Antarctic, Valerian Aleksandrovich Zorin, Soviet Ambassador to France, told the Consultative Commission of the Antarctic Treaty today.

The French Foreign Minister, Michael Debré, said the treaty was remarkable in that the 12 member nations "have renounced the usual sovereignity quarrels."

The treaty was signed in Washington in 1959 by Argentina, Australia, Belgium, Britain, Chile, France, Japan, New Zealand, Norway, South Africa, the Soviet Union and the United States.

HIGHEST CONTINENT

Average elevation above sea level of Antarctica, highest of all the world's continents, is about 8,000 feet. Some of its mountains jut through icecaps 14,000 feet thick.

Japan Plans Antarctic Rocket Shots

PARIS, Dec. 1 (Reuters)—Japan will launch some 10 rockets in January 1970 from the Antarctic to explore the continent's upper atmosphere, according to Prof. Takeshi Nagata, head of the Japanese delegation to the Consultative Conference on the Antarctic which ended here Friday night.

Nagata, who initiated Japan's expeditions to the South Pole which started 12 years ago, said the rockets would be fired to an altitude of 200 km.

An 11-man Japanese expeditionary team was already on its way to the South Pole to study the layer of ice covering the continent and the meteorological conditions in the area, he said.

He added that a second team leaves Tokyo Saturday for the Antarctic with about 650 tons of material to start building the launching sites for the rockets.

Nagata also said the countries attending the conference had decided to build three permanent radio stations in the Antarctic to ensure regular contact between the continent's many bases.

Air New Zealand Weighs Tourist Runs to Antarctica

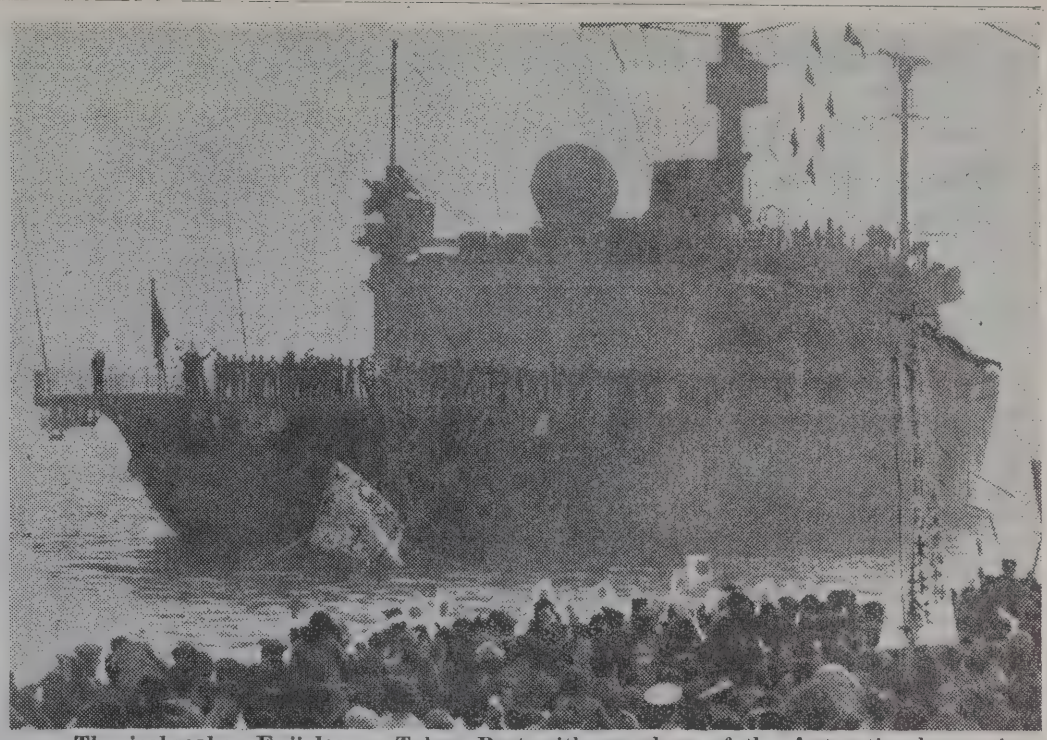
WELLINGTON, New Zealand (Canadian Press)—The big barrier to opening up Antarctica to tourists up to now has been lack of accommodation. Space at existing bases is strictly for official visitors on business.

Consideration now is being given to meeting the problem by mooring a vessel at the edge of the ice.

Last year, the Magga Dan, a vessel built for passage through ice, took the first two parties of tourists to the Mc Murdo Sound sector of Antarctica in voyages from Christchurch, New Zealand.

But the trip to the southern continent is usually rough and uncomfortable and takes too much of the available time.

Now plans are being examined to moor the Magga Dan in the McMurdo Sound area as a floating hotel base for visitors flown in by Air New Zealand.



The icebreaker Fuji leaves Tokyo Port with members of the Antarctic observation team on board

10th Antarctic Team Leaves

The 10th Japanese Antarctic Observation Team left Harumi Pier in Tokyo at 2 p.m. Nov. 30 aboard the 7,760-ton icebreaker Fuji for the Antarctic.

The 40-member team headed by Dr. Ko Kusunoki, 47, is scheduled to arrive at Luetzow-Holm Bay at a point 2,200 km. from the South Pole on Jan. 9, next year together with 182 crew members, a cameraman and a reporter, according to a spokesman for the team.

Unlike in previous years, no ceremony was held at the pier Saturday because the Antarctic visit has by now become routine, according to sources in the Ministry of Education.

The Fuji will return to Tokyo on April 25, next year with the ninth wintering observation team which is now stationed at Showa Base in the Antarctic.

This year's observation team is taking for the first time a small airplane with it for aerial photography to produce accurate maps of the ice-covered continent.

The spokesman also said that Dr. Gerald A. Roach of the University of Denver will come aboard the Fuji at Fremantle, Australia, when the ship calls at the port on its way home next year. He will visit Japan as an exchange scientist.

Marooned Explorers Safe

LONDON, Dec. 21 (AP)—Five British explorers returned to their base after being marooned for 10 days in the wastes of Antarctica, the Admiralty reported today. The men were stranded after their twin-engine plane ran out of fuel on a survey mission over Graham Land, a spokesman said. Helicopters from the Royal Navy's ice patrol ship Endurance dropped fuel and the plane flew back to its base on Adelaide Island.

Antarctic Expedition Set

MOSCOW, Sept. 22 (Reuters)—A 300-member expedition is preparing to leave the Soviet Union to set up a new weather station in the Antarctic, the official press agency Tass reported today. Scientists from France, East Germany, Poland and Russia will sail in mid-October, Tass said.

Tass Depreciates Report Of Antarctic Sea Serpents

MOSCOW, Dec. 2 (UPI)—Russian helicopter pilots reported sighting 48-foot sea serpents in Antarctic waters, Tass said today. But the official Soviet press agency put down the report as a case of mistaken identity.

Quoting an expert at the Moscow Institute of Oceanography, Tass said "huge sea snakes" reported by the pilots were probably floating islands of seaweed or possibly the tentacles of a giant squid.

The report from near the South Pole was relayed to Moscow by radio from the Soviet whaling base in Antarctica. The pilots said the "serpents" were light brown in color.

Tass said the pilots did not take pictures of the phenomenon.

Russians Head for Antarctic

MOSCOW, Oct. 22 (Reuters)—a Soviet vessel left Leningrad for the Antarctic today carrying members of the 14th Soviet expedition to the continent and about 1,700 tons of scientific equipment, food and other supplies for various polar stations, the official Soviet press agency Tass reported.

Antarctic Land Studied

MOSCOW, Nov. 6 (Reuters)—A Soviet scientist contended Wednesday that aerial photography showed ice-free land in the Antarctic was 11,000 to 15,000 square miles, which is much less than estimated earlier. Prof. Yevgeny Korotkevich, deputy director of the Leningrad Institute of Arctic and Antarctic Studies, said most previous estimates had put the figure at 230,000 square miles.

Canadian Eskimos Adopting White Man's Ways

Nomadic Life on the Wane in Arctic — Schooling on Rise

The New York Times

BY THE ARCTIC SOUND, Northwest Territories — Noah Etokana lives with his father, mother, brother and three sisters in a white tent a few yards from these west-central Arctic waters.

Two other Eskimo families live nearby in their own tents, each about eight feet on a side. In winter, the Eskimos will live in igloos, probably at a better site for trapping.

In summer, Noah Etokana sets nets to catch Arctic char, which resemble and taste like salmon, and he hunts the caribou, whose huge antlers are used for artistic carvings and whose meat tastes like pot roast.

In winter, Noah does not accompany his father and the sled dogs to the trap lines. Instead, he goes to school at Fort Simpson, 400 miles southwest of here. He lives there from September to June in a student hostel financed by the Canadian Government.

Noah, 18 years old and in the eighth grade, hopes to be an airline pilot. It is not inconceivable that he will become one.

Noah Etokana is a vivid example of the revolution in culture and aspirations that is changing northern Canada—the subarctic scrub-tree lands of the Indians and, above the tree line, the dark green, rocky Arctic tundra of the Eskimos.

It is a revolution introduced by the southerner, or white man—the Distant Early Warning (DEW) Line builders from Washington and New Jersey in the middle nineteen-fifties, the mineral prospectors from Toronto and Vancouver in the sixties, and through it all, the Ottawa officials and legislators who had felt that the federal Government has a moral obligation to give every northern Canadian a warm, dry house and a chance to get an education.

The DEW Line jobs, the Government-built houses, the schools and perhaps, welfare payments too, have brought Indians and Eskimos in from the bush and the trap lines to live in settlements that range from 50 to 500 inhabitants.

Regular medical attention in the settlements has lowered the death rate, particularly among infants. Population is growing in the north nearly three times as fast as in southern Canada.

As the settlements flourish they become too big to feed themselves from the surrounding land and waters. Moreover, with children attending school, mothers are reluctant to accompany husbands to the trap lines. Without their women, to cook for them and to skin or butcher the animal carcasses, the men do not like to go trapping or hunting.

The number of jobs in the minuscule northern "wage economy" has failed to grow apace with the settlements and with the numbers of young men and women who, unlike their parents, have learned to read and write and who reject hunting, trapping and fishing as a way of life.

And so arises what officials regard as their most vexing problem — welfare. The white man's Government doles it out — but with deep misgivings.

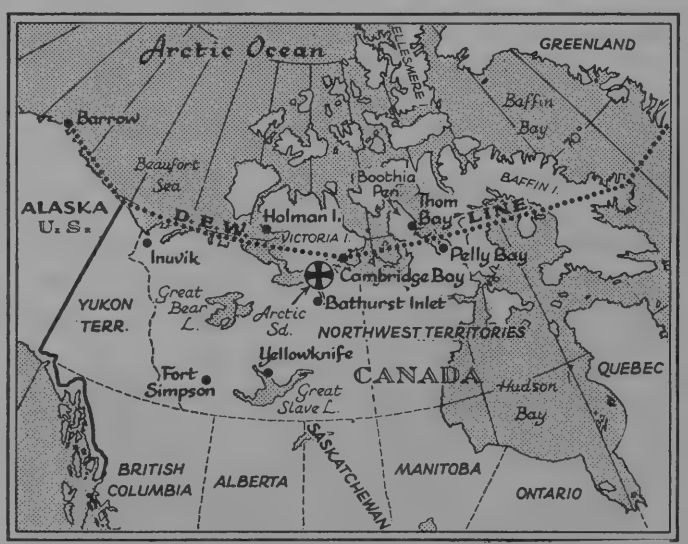
Stuart M. Hodgson, the big, bluff Commissioner of the Northwest Territories, finds that the communities with few or no welfare recipients, such as Pelly Bay in the central Arctic, are the communities with initiative and good leadership.

He is more disposed to make extra grants for specific projects to them rather than to places like Eskimo Point on Hudson Bay, which has a long welfare list and a listless air about it. As everywhere, success breeds success.

Often the people feel themselves caught in a conflict between the wage economy's imperatives — to be at one's job punctually and regularly — and the casual, unscheduled ways of traditional Indian and Eskimo life. Children and adults eat when they are hungry, play under the midnight sun until they take themselves to bed and, if they like, sleep until noon.

Commissioner Hodgson tells the story of the teen-age baker's apprentice who was scolded for not coming to work on time, at 7 A.M. "How do you expect me to be here at 7 when I don't get up until 8?"

Noah Etokana displays knife used to cut snowblocks in winter. At right is white skin of caribou, killed during winter. Noah and family live in tent, rear, close to Arctic Sound.



The New York Times Aug. 8, 1968

Etokana family lives on the edge of Arctic Sound (cross)

he retorted angrily.

The pattern of change in the North was observed on a recent nine-day, 5-000-mile airplane tour of 17 settlements in the western and central Arctic with Commissioner Hodgson, two appointed members of the Northwest Territories quasi-legislative council, one elected member, several officials and several wives.

The weather was mostly glorious—sunny and in the 50's or 60's by day and in the 40's at night. As advertised, the black flies and mosquitoes were not lacking. Above the 70th Parallel, the sun could be seen 24 hours a day. Children gamboled at midnight, jumping rope or trying to run on a barrel.

At Holman, ice nearly prevented take-off. Along the rocky shores of Pelly Bay, ice floes several feet thick forced the aircraft to send its passengers ashore by small boat.

Even in midsummer, ice clogs some harbors and prevents the pontoon-equipped airplane from landing. The waters east of Victoria Island were covered with ice cracked in a thousand directions.

That looked from the air like an enormous jigsaw puzzle.

The warmth with which the Commissioner's party was received varied directly with the remoteness of the settlement. Especially moving was an arrival close to midnight at Thom Bay, on the eastern shore of Boothia Peninsula. The Rev. Joseph Leverge, the Roman Catholic missionary who lives there in summer, hurried to the water's edge, eagerly invited the guests to have coffee and apologized for the fact that he was in the midst of painting the two-room mission.

As the visitors strolled about the bluff on which the mission stands and admired the tranquil, softly lighted landscape of water and tundra, Eskimos —husbands, wives and toddlers —trudged up the slope to say hello.

Shortly, two canoes were paddled across more than a mile of water by Eskimos who wanted to meet the newcomers. Some spoke only a few words of English, but they listened and watched with unflagging interest.

The mission and the red and white transmitter tower for the two-way radio are the only signs of the white man at Thom Bay. Six families and one unmarried man form the community. A few children go to school at Inuvik, half the Arctic away.

When the Eskimos are ill they see Miriam Nilaulak, who thinks she is about 30 years old (many adult Eskimos are unsure of their age). She has never been to school but she has taken a short course as a lay dispenser of medicine. She operates the radio in winter and can request air evacuation of seriously ill persons, part of the free medical service the Federal Government provides all over the North.

Jim Stevenson, a gentle, middle-aged bachelor, the lay dispenser at Bay Chimo, on Bathurst Inlet, is the manager of the Hudson's Bay Store. He stocks vitamins, antibiotics, sulfa tablets and urinalysis kits in addition to the standard Bay store items—food, cotton goods, cooking utentils, toys, hardware and outer garments.

He dispenses medicines on the instructions of the nurse at Cambridge Bay, 150 miles away, whom he consults by radio much the way parents consult a pediatrician on the weekend by telephone.

One hundred fifty miles is nothing as northern distances go in the air age, and airplanes, shod with skis, wheels or floats, are the principal means of transportation. From the air one is never out of sight of water over the Northwest Territories, which stretch 2,100 miles from east to west and whose 1,235,000 square miles equal in area all of Canada east of Saskatchewan. Canada's North also includes the Yukon Territory and northern Quebec.

The countless puddles, ponds and lakes, a remnant of the Ice Age, make much of the North uninhabitable and explain in part why one can fly hundreds of miles in a straight line and see no sign of human life.

The 1967 population of the Northwest Territories was 29,200, including 5,700 Indians, 10,300 Eskimos and 13,200 whites. Most of these people lived in 73 settlements and towns.

Even if, as projected, the high 4 per cent annual rate of natural increase doubles the population in 18 years, it is doubtful that new settlements will spring up, except perhaps where mineral deposits are found.

With Ottawa gradually giving the North more self-rule, such problems as jobs, housing, welfare and education are becoming increasingly the responsibility of the territorial government. It is a poor thing as governments go because it lacks both the powers accorded to provinces and any tax base worth mentioning.

In 1966-67, revenue came to only $8.4-million, including $2.1-million in Federal grants. Of about $100-million of expenditures, more than 90 per cent came from the federal Government, according to Commissioner Hodgson, a 44-year-old former labor leader from Vancouver. The commissioner is appointed by Ottawa.

Indians and Eskimos have the franchise, but local government is almost nonexistent, especially among the Eskimos.

Last year the territorial government moved from Ottawa to Yellowknife, a rapidly growing town of 5,000, which has the only paved roads in all of the Northwest Territories and a style that might be called frontier-suburban. Indians in faded work clothes shop and drink next to whites in business suits or stylish dresses.

It seems certain that the North of igloos and tents, kayaks and canoes is doomed. Mrs. Elizabeth Banksland, who lives with her husband and five children in an unpainted, one-room house at Holman, on Victoria Island, explained why. The house is heated with an oil-burning stove. "It is warmer in winter," said Mrs. Banksland, than the igloo she grew up in.

The New York Times (by Edward Cowan)

Stewart Hodgson, Commissioner of Northwest Territories, holds Eskimo girl during visit to Paulatuk on Arctic Coast.

NORSEMEN'S TRACES IN QUEBEC REPORTED

QUEBEC, Oct. 12 (Canadian Press)—A Laval University archeological team has made "significant discoveries" in northern Quebec indicating that Norsemen occupied the Ungava Peninsula in the 12th century, the university reported this week.

A report by the party, under Thomas E. Lee of Laval's Nordic studies department, said the finds had been made in the course of a summer canoe trip from Fort Chimo along the west side of Ungava Bay into Hudson Strait.

Other members of the party were Pierre Bedard and Michel Morissette of Quebec and Paul Aubin of Montreal.

The party described as "most spectacular" the remains of a Norse longhouse found about 70 miles up the coast from Payne Bay.

"The ridges of the earthen walls are clearly defined," it reported. "The house was 115 feet long and 24 feet wide, with rounded ends similar to those previously examined on Pamick Island. There were four cross walls or partitions, as indicated by low earth ridges.

"The architectural style matches some in Iceland and the Hebrides, according to informed opinion, and suggests a time between A.D. 1100 and 1200."

Another find was a group of three stone beacons on an island, "clearly set up for navigational purposes."

Arctic Eskimos in Canada Run Flourishing Co-op

By EDWARD COWAN
The New York Times

PELLY BAY, Northwest Territories—Eskimos in this rock-bound central Arctic settlement have organized a cooperative whose income this year is likely to approach $100,000.

The Pelly Bay Co-op is earning money from the construction of an airstrip; erection of prefabricated houses supplied by the Government; the sale of soapstone carvings and other handicraft products; fish, fur and sealskins; providing municipal services, such as delivery of heating oil and garbage disposal; operation of a snack bar and a self-service laundry, and lodging, feeding and guiding well-heeled fishermen who come to the Arctic for the abundant char and 30-pound lake trout.

Pelly Bay's co-op is more active and diversified than most in the North. Lloyd I. Barber, an appointed member of the Northwest Territories Council, holds up Pelly Bay as an example of what a commuity can achieve economically.

In a recent tour of the North, Dr. Barber, who is Dean of Commerce at the University of Saskatchewan's Saskatoon campus, and some other council

Settlement's Effort Is Cited as Example of Bootstrap Prosperity in Northwest

members found both bootstrap prosperity and deeply entrenched reliance on welfare payments.

Development of a wage economy is the Canadian North's most pressing need. In the race between education and jobs, according to Stuart M. Hodgson, Commissioner of the Northwest Territories, "education has won so far; now the job is to fuse the educated into the labor market."

"The reason I'm an optimist," said Dr. Barber during a 200-mile flight between settlements, "is that if you bet your money on education, the dice have to come up for you."

Within a few years every Indian and Eskimo child will be getting at least a primary education. Many now are in higher grades and a handful go to college each year.

The deepest fear of Canadian whites charged with northern development is that the tens of millions of dollars spent each year on houses, airstrips, medical services, education and communications will produce a supine Indian and Eskimo population of former outdoorsmen who have come in from the cold but cannot get jobs.

There were some 5,800 Indians, 10,300 Eskimos and 13,200 whites in the Northwest Territories in 1967.

"We can afford to do what's required," said Dr. Barber, a husky 36-year-old former hockey player. "The problem is that we don't always know what we should do."

He meant that no single approach would assure northern Canada's economic fulfillment. Consequently, the Canadian Government is pursuing several approaches.

A Government-organized enterprise at Rankin Inlet cans Arctic char, a delicious salmon-like fish, and fish chowder. It employs 22 Eskimos full time and hopes to ship 500,000 cans this year. It is run now by a white administrator, but the Government hopes to sell it to the local Eskimo co-op, probably at a bargain price.

Under the direction of a quiet, strapping ex-Mountie named Tom Auchterlonie, the territorial government encourages the development of fishing camps. The customers, mainly American businessmen, pay up to $350 a week, including air fare into and out of the bush.

In the high Arctic, the Government is a partner in a search for oil. Elsewhere, it gives exploration grants to prospectors and pays up to half the cost of the local roads and airstrips that minerals producers must have to move men and equipment.

One difficulty is that most mineral work is fairly skilled. Employers complain that the Eskimo and Indian lack skills and reliability. Some northerners, such as Duncan M. Pryde, an elected member of the Territorial Council, reply that some businessmen seek to exploit local help by paying low wages.

Ottawa is expected to grant several licenses for east-west air routes across the Arctic. None exist now. Such service would bring in more tourists and give impetus to the development of commerce.

Dr. Barber believes that cottage industry can contribute to northern prosperity. Indian beadwork and Eskimo soapstone carvings are potentially big sellers to the south, but there is a marketing problem. Most Eskimo co-ops now have three-man committees to determine how much to pay for each carving. The artist gets the average of the members' respective valuations.

The best hope for the brighter Indian and Eskimo youngsters is that they will get enough education to qualify as civil servants, nurses and teachers, displacing whites.

Michael Kusugak, 20 years old, of Rankin Inlet, on Hudson Bay, will go to college this autumn to study medicine, the first from the Keewatin district to do so.

His brother, Jose, 18, in the 10th grade, hopes to become a government administrator.

Some whites say that the gap between standards of living is widening as the whites forge ahead despite high prices and wage costs.

Yellowknife, the territorial capital, is getting a million-dollar addition to its main hotel. Sachs Harbor, an Eskimo settlement on Banks Island, seeks a water-supply system.

The Rev. René Fumoleau, a Roman Catholic missionary at Fort Franklin, cautions against trying to push the indigenous people of the North too quickly.

"You know our co-op," he said. "If it had been my business it would be ten times bigger, but the people who run it now would not learn anything.

"I believe in the potentialities of natives all over the world. You have to let them do things in their own way. Sometimes they make mistakes. You know, sometimes the pace of change is too fast for them. You have to let them go at their own pace."

The New York Times (by Edward Cowan)

A clerk measuring a purchase in the Issatik Eskimo Co-op at Whale Cove in the Northwest Territories of Canada. Co-ops are part of economic development plan for territory.

Arctic Nurses Wear Many Caps, Including Doctor's

By EDWARD COWAN
The New York Times

CAMBRIDGE BAY, Northwest Teritories—It was a typical day. In the morning Annette Blake assisted at the birth of an Eskimo baby; in the afternoon she saw patients at the clinic and in the middle of the night she sewed up a bad laceration.

Miss Blake is a nurse, not a doctor, but like most of the nurses in Canada's North she does a doctor's work.

Most northern settlements are too small and isolated to have the services of a regular physician. When it is possible, nurses send those seriously ill to hospitals or doctors in southern Canada.

Delivering babies is routine. Miss Blake, who is 27 years old, has brought more than a hundred into the world in her two years at Big Trout Lake, a remoate Indian village in western Ontario, and in her year here at this Eskimo settlement on the southeastern tip of Victoria Island, in the Arctic.

A Scotswoman who first saw Canada on a Girl Guides tour 10 years ago and decided to return, she worked in a Montreal hospital for a time.

"I didn't enjoy it," she explained over a cup of coffee in the modern kitchen of the big frame house in which she lives and works.

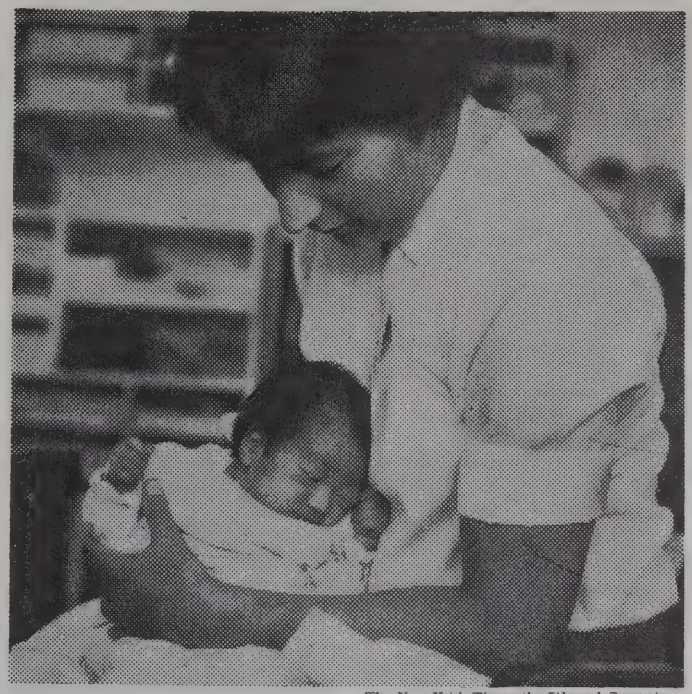
"It wasn't satisfying. I wasn't working hard enough. Here there is much more scope for things you can do if you want to do them. If you deliver a child you know the mother, you know the baby, you watch the baby as it grows. I think it's close contact with patients that's so satisfying. There is no more satisfying nursing than this."

Canada's Department of National Health and Welfare assigns nurses in pairs so that they can be of comfort to each other psychologically and alternate on night and weekend duty. Sometimes the nurses are the only whites in the community. But more often than not there is a Hudson's Bay store man, a missionary, a teacher or two and perhaps a Mountie.

Even so, a young woman must depend on her own resources. Miss Blake likes to fish, ski and go for walks across the dark green rolling tundra. "There's quite a lot to do," she said.

What about marriage?

"I've thought about it," she replied with a smile. What she left unsaid is that she is not mooning about it until it happens.



The New York Times (by Edward Cowan)

Annette Blake, nurse, caring for a baby that she delivered

Miss Blake earns $6,000 a year. She pays a nominal rent for her comfortably furnished quarters, gets subsidized food, five and a half weeks' vacation a year and the cost of an annual roundtrip by air "out," the northern expression for going to southern Canada.

There are supposed to be three nurses and a doctor to look after Cambridge Bay's 550 residents and to visit neighboring settlements, such as Gjoa Haven, 200 miles eastward. But the doctor quit months ago and for some weeks this summer Miss Blake was the only nurse here.

Dentists tour the North, but in between their visits a nurse may have to pull teeth, too.

A northern nurse also has a preventive-medicine, or public-health, role. Miss Blake conducts a baby clinic and visits the homes of infants and preschoolers "to see how the family is doing."

Miss Blake is assisted by a community health worker, an Eskimo who visits households to instruct women on how to keep drinking water clean ("cover the barrel") and how to dispose of the plastic bags that line the dry toilets found in the North.

Miss Blake's efforts epitomize Canada's costly northern medical-service program, which has lowered the death rate among Indians and Eskimos, thereby causing a population boom, and has raised the general level of health.

But 43.3 per cent of all Eskimo deaths in 1967 occurred in children who were not yet a year old. The remedy lies, according to the Northern Medical Service, in providing regular services for some of the larger settlements still without a resident nurse.

The problem is not simply budgetary. The turnover among nurses is high. Many are foreigners, notably Britons and Australians, for whom working in the North is an adventure. Not many Canadian girls take up the work.

The best solution for the shortage of nurses appears to be for Indian and Eskimo girls to be trained for the job. Officials are hopeful that a program along these lines will be started in the next few years.

Montreal Airline Services Canadian Arctic With Jets

NORDAIR, Ltd., a regional airline based in Montreal, has become the first line to operate regular, scheduled jet service into the Canadian Arctic, the Aviation Daily reports.

Using a Boeing 737, the line eventually plans to replace its Super Constellations, which have been the mainstay of its northern route network out of Montreal.

Resolute Bay, 150 miles from the magnetic North Pole, has a 6,000-foot airstrip topped with loose gravel, which prevents most jets from using the field. Other fields on Nordair's routes have similar problems.

EXPERTS STUDY DATA ON PACIFIC CHANNEL

WASHINGTON — United States oceanographers are studying new data on a sea channel at the bottom of the North Pacific, just south of the Aleutian Islands, which once connected the North American Continent with a vast underwater plain.

When the Aleutian Trench was formed about 10 to 15 million years ago, it apparently broke the channel, which had once carried mud out to the plain from the mainland. Since then, the only deposits received by the plain have been airborne dust and the remains of living organisms from the sea above it. The plain lies three miles below the surface of the North Pacific.

The channel is regarded by scientists as a repository of evidence that may shed new light on the geological history of the area.

An investigation of the sea channel was conducted in April by segments of Environmental Science Services Administration. It was a joint venture of the Pacific Oceanographic Research Laboratory at Seattle and Coast and Geodetic Survey Ship, Oceanographer. The Seattle-based ship is commanded by Capt. John O. Phillips.

Barrett H. Erickson, of Eveleth, Minn., a geophysicist, was chief scientist during the investigation. He was assisted by Paul J. Grim, of Washington, D. C., and William H. Lucas, of Laurel, Miss., geophysicists.

Infrared Thermometer Used To Chart Weather Trends

MADISON, Wis. (AP) — An infrared thermometer used in aerial observation may give climatologists new clues in the "why" of winter weather, a University of Wisconsin scientist said.

Wayne Wendland, a University of Wisconsin graduate student, told a symposium how research techniques he had helped develop were recording significant temperature patterns in the waters of Hudson Bay in Canada.

Since Hudson Bay is the spawning place of air masses over eastern Canada, changes in water temperature are meaningful to climatologists and ecologists.

Arctic Oil Hunt Cheers Canadians

By EDWARD COWAN

The New York Times

OTTAWA—The first phase of a joint Government-industry search for oil in the high Arctic has ended on an optimistic note.

Crews left Melville Island after completing 700 miles of seismic surveys on the Northwestern Peninsula, the Sabine Peninsula and the Burnett Point area.

The Department of Indian Affairs and Northern Resources is pleased with both the indicated results of the surveys and with the outcome of experiments in the use of a new type of ice-breaking device for ships.

Even if oil is found in the high Arctic, it will be worthless unless an economical, reliable method is devised to move the oil through frozen or ice-clogged waters.

"Several drillable prospects have been identified" by the seismic surveys, a high official reported, and plans are well advanced to drill test holes in 1969. The seismic work will continue on Melville and other of the Queen Elizabeth Islands.

Officials said that the seismic data and tests of the ice-breaker, called the Alexbow—a prow that is attached to a ship's bow—have not yet been fully evaluated. But there was no mistaking the officials' satisfaction with the preliminary findings.

In fact, thought is being given to increasing the $20-million capitalization of the joint venture company, Panarctic Oils, Ltd. The Government owns 45 per cent of the equity and 20 companies and individuals hold the rest.

The Atlantic-Richfield oil strike this summer on the northern coast of Alaska has touched off a wave of interest in the Canadian coastline along Amundsen Gulf and the Caronation Sea.

For the last 10 weeks, oil and gas permits covering about 57 million acres have been issued ,as against 190 million acres in the preceding eight years.

In a year or two, American and Canadian oil companies may pour survey and drilling crews into the northwestern corner of Canada. Whom they hire could be affected by Panarctic's plan to employ Eskimos in next summer's drilling on Melville Island.

The Eskimos will be trained this winter at Edmonton, Alberta, as part of a Government experiment to show that the idigenous peoples of the north can be effectively employed by minerals companies, in technical as well as menial jobs.

Cabinet officers and civil servants are aware that companies have had problems keeping Indian and Eskimo employes on the job.

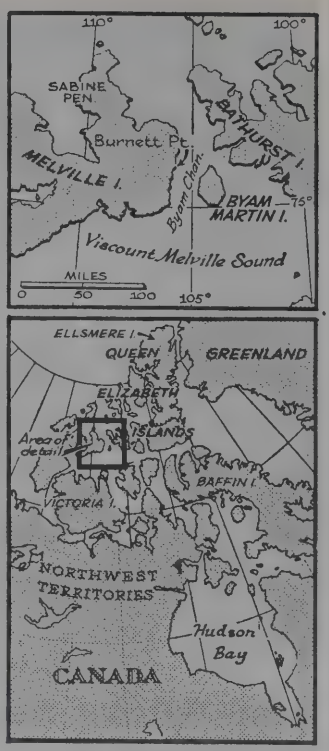
The companies prefer to bring in white men from the south despite the extra cost of several hundred dollars a man for transportation.

In Ottawa, the feeling from Jean Chrotien, the Minister of Indian Affairs and Northern Development, and others is that companies must give on-the-job training and be more tolerant of the tendency of Indians and Eskimos to leave jobs during traditional hunting, trapping and fishing seasons.

"Why shouldn't they spend some of their profits on social development?" asks a senior official rhetorically.

These convictions are likely to be applied with new vigor if the Panarctic experiment works well.

The Alaska discovery has given new impulse to talk by officials of the United States Coast Guard of digging a canal across the base of Point Barrow, Alaska, thereby establishing assured ship access to the east in summer.



The New York Times Sept. 23, 1968

Site of the joint oil exploration in the high Arctic.

Access is now uncertain because of the tendency of the permanent polar icepack to press against Point Barrow, even in summer.

Discovery of more oil along the northern coast of Alaska and Canada conceivably could lead to joint American-Canadian financing of a canal.

Replica to Retrace Sail to Hudson Bay Of Nonsuch in 1668

APPLEDORE, England (Reuters)—Craftsmen in this Devon fishing village have built the exact replica of a little ship that sailed cautiously into the unknown waters of Hudson Bay 300 years ago with its crewmen anxiously watching the shore and her six cannon at the ready.

The replica was built to mark the 300th anniversary of the original voyage, and it is hoped the ship eventually will sail across the Atlantic to Canada following the course of its ancestor.

The original ship was the 43-ton ketch Nonsuch, which left the River Thames at London in the summer of 1668 and returned 16 months later loaded with valuable beaver skins.

The voyage went down in history because it led to the founding of the famous Hudson's Bay Company, which received a charter from Charles II in 1670 and opened up trade with the New World.

The company decided to mark its anniversary by having a replica of the Nonsuch built, and found a shipbuilding company willing to take on the task, using the same construction methods as were used in the 17th century.

The builder, Hinks and Son, called in experts of the National Maritime Museum and some veterans who had learned their trade as boys repairing Britain's last wooden sailing ships.

The workmen practiced old-fashioned, forgotten skills, and then put together the skeleton with 17th-century-type iron bolts and planked up the hull with planks softened by steam. No laminated timber was used, only seasoned solid wood.

A group of 17th-century tycoons, known as the "Company of Adventurers of England," backed the original voyage, impressed by potential profits from furs.

The vessel that conquered the Atlantic was 36 feet long and 15 feet wide. It carried a crew of up to 24 and had six small cannon.

Its stores included tar, compasses, blunderbusses, muskets, pistols, powder, shot, beef, oatmeal, raisins, prunes, sugar, spice, oil, lemon juice, paper and quills, eel nets, beer and brandy.

The captain was told to be cautious in trading with the Indians, to keep in mind the possibility of discovering a northwest passage to the "south sea"—the Pacific—and to keep journals and maps.

A ship accompanying the Nonsuch, the Eaglet, was driven back by a storm, but the Nonsuch went on and eventually reported seeing "many islands of ice, some very great and some small ones."

It sailed into Hudson Bay, guarding against any dangers the unknown shores might produce, and the crewmen founded Fort Charles, a log-built post from which they bargained and argued all winter with the local Cree Indians.

CLASS ENDS IN MAY FOR ESKIMO PUPILS

CORAL HARBOUR, Northwest Territories (AP)—The Friday night movies are old; it is 10 miles by snowmobile to the Saturday night dance, and Miss Jennifer Mills' Eskimo pupils often come visiting at 10:30 P.M.

But the 23-year-old Montrealer is hooked on teaching in the Northwest Territories.

The pastel-painted classroom and its familiar primers might belong to any first grade in a southern city. But Coral Harbour's school years starts in August and ends in May so the boys can join their fathers in the sleds for seal hunting before the ice breaks up in June. The community of about 300 is at the north edge of Hudson Bay.

School starts at 8:30 with cocoa, biscuits and chewable vitamin tablets for everyone.

2 Canadian Lakes Named

YELLOWKNIFE, Northwest Territory (Canadian Press)—The territorial government announced that two northern lakes had been named after Peter Bromley and Dr. Ian Calder. The Yellowknife men drowned last year while canoeing on Black River.

CANADIAN TOWN BUILDS AIRSTRIP

Flights Are Now Scheduled The Year Round

ESKIMO POINT, North West Territories (Canadian Press)—How do you build an airstrip? The people of Eskimo Point did it by going out and picking rocks when they grew tired of waiting their turn for a Government-built landing strip.

This community of 500 Eskimos and 45 whites 180 miles north of Churchill, Manitoba, never has been prosperous. In winter, it has some of the most severe weather in the Arctic; in summer, the land around it is a morass of ponds 18 inches deep, havens for mosquitoes and sealed from draining by the permafrost.

Since the 1950's there have been successive epidemics of tuberculosis and other diseases.

Sickness was made more serious by the lack of a year-round airstrip. In winter, regular scheduled flights landed on the ice of Hudson Bay and in summer float planes landed on the water when and if they could. But for three to six weeks at spring breakup and again at freeze-up in the fall, the community was isolated.

"If you ever had any emergencies, you couldn't get anyone out and you couldn't get anyone in," said assistant administrator Tommy Pringle.

This summer, when Eskimo Point was humming with construction projects, residents saw their chance. A school addition was going up, new homes were being built and two 30-ton crawler tractors had been flown in during the winter to dig a new reservoir.

Carl Taylor of Prince Albert, Saskatchewan, a foreman and heavy-equipment operator, said he was asked one day whether he thought he could build an airstrip on a natural ridge west of the town.

"I had started at this reservoir one day, "Mr. Taylor said, "when the mechanic, John Sigurdson, came around and said, 'Can you build a strip here, Carl?'

"Next day I was working on it.

"I said it was just going to be a lunch making an airstrip there. But it turned out to be a pretty big meal."

It took two tractors about a month to smooth the rock and permafrost into a strip just long enough for a DC-3 with a good pilot to land.

Mr. Taylor, who had worked on Saskatchewan airstrips in Prince Albert, Saskatoon, Moose Jaw and Swift Current, laid out the strip.

"We lined it up with gasoline barrels," he said.

When the tractors were finished, administrators' wives organized a free supper and movie in the schoolhouse, and the community cleared the strip of loose rocks.

"The whole settlement turned out," Mr. Taylor said. "Eskimo women went around with babies on their backs and picked up rocks. We tried to discourage the kids, but they were there too."

The Roman Catholic and Anglican priests and the Alliance missionary picked up rocks. The two nurses from the nursing station picked up rocks. The constables of the Royal Canadian Mounted Police picked up rocks.

Trans Air Ltd. now has scheduled flights, Tuesday and Friday the year round to Eskimo Point.

City Will Rise Deep in the Arctic At Rugged Site on Frobisher Bay

By JAY WALZ
The New York Times

OTTAWA, Sept. 28 — The Canadian Government received bids this week for the construction of a new city in the Far North. It will rise at Frobisher Bay, on Baffin Island, where 1,700 Eskimos and whites now live precariously.

Five Canadian concerns seek the contract to lay out and construct a town where, even in summer, frozen ground—the permafrost—lies just a foot beneath the surface along the rocky, rugged shore, and where the snowfall averages 102 inches a year.

The Government and private business will spend $15-million in the next five years to bring the residents to at least the fringes of prosperity as southern Canada knows it.

There are no roads to Frobisher Bay, 1,200 miles north of Montreal. Slow boats dock only from July 15 to Oct. 15, but a commercial airline flies there three times a week, taking passengers one way for $125.

The bids that the Department of Indian Affairs and Northern Development is studying call for an office building, a shopping center, a hotel, a recreation hall and some housing. Accessory development will include schools, cinemas, bowling alleys and hospitals.

This is the largest development project in North America's eastern Arctic. It is also the first community development that the Government has undertaken since the establishment of a modern town at Inuvik, in the western Arctic, 10 years ago.

The New York Times Sept. 29, 1968

This is not the first attempt to develop Frobisher Bay, an inlet at the southeastern corner of Baffin Island. It was a trading post of the Hudson's Bay Company in 1914. In 1942 the United States built an airfield there as part of the route to Europe. After World War II it became a refueling stop for transport planes. In 1959 a United States Air Force base was established.

At every state of development Eskimos drifted in looking for jobs and neglecting their old talents for fishing and hunting. Too many of them are now dependent on welfare.

Then jet air travel eliminated the need for refueling stops and in 1963 the United States Strategic Air Command withdrew, leaving behind a handsome four-story building now used for Government offices and as a hostel.

With the Americans gone, the bottom fell out of Frobisher's economy.

"Something must be done there," John MacDonald, Deputy Minister, told a recent visitor. "The people are there. The Eskimo population is growing. We have to go in."

Mr. MacDonald is confident the establishment of urban facilities and services will attract private business. "This is a real breakthrough," he said, leafing through his blueprints and bids.

CARIBOU MIGRATIONS STUDIED OVER YEARS

WASHINGTON—Caribou are probably the most migratory of all deer.

In late summer, family units gather in herds drifting from tundra above the Arctic Circle to the shelter of timberlands. They generally follow a counterclockwise route. Often they travel in massive bands, at other times in straggling groups, the National Geographic Society says.

A famous hunter in northwestern Canada once reported a migrating herd that extended 10 miles in all directions. Another took four days to pass a given point.

Nature held the caribou population in check until advancing civilization almost wiped it out. Repeating rifles turned hunts into massacres. Whole herds were ambushed. Destructive fires reduced forage.

A 1949 aerial survey in Canada showed that the caribou, a first cousin of the European reindeer, had declined to about 700,000, one-third of their number in 1900. A more alarming 1955 study found only about 278,000.

Concerned officials stepped up fire-control and curtailed hunting. These measures, plus a more favorable weather cycle, have brought the population to approximately 357,000. An annual increase of about two per cent is predicted.

SCIENTISTS RECORD SOUNDS OF WHALES

SUITLAND, Md. — Scientists of the United States Naval Oceanographic Office and the University of Rhode Island recorded the sounds of seven different species of aquatic mammals on a cruise off Nova Scotia, Newfoundland and New England.

The tapes, kept for the Nevy in the Library of Underwater Sounds of Biological Origin at the university, are being studied to compare the mammal talk with similar sounds heard by Navy sonar operators while tracking submarines.

In addition to recording the mammal talk, the scientists, led by Dr. H. E. Winn, professor of oceanography at the University of Rhode Island, bounced sonar signals off the bodies of the aquatic mammals to determine the strength of the resulting echoes.

These echoes, Lieut. J. Lawrence Dunn, a biologist who specializes in bioacoustics, reported also have created problems for the Navy's antisubmarine forces.

Arctic Copper Deposits Lure Prospectors

By EDWARD COWAN
The New York Times

COPPERMINE, Northwest Territories—Short and pixyish looking, clad in work pants and flannel shirt, the baldish man with the sunburned forehead and pale blue eyes looked like a drilling-rig operator or one of the North's peripatetic mining-camp cooks.

But as he pointed to a map in the base-camp engineering shack—a rather sturdy shack with electricity and oil heat — and talked with confidence, almost certainty, about finding profitable copper deposits in these Arctic "wastelands," Murray Watts's true vocation emerged.

He is a man with an instinct for metal, a prospector who has discovered rich lodes of copper, iron, nickle, lead, zinc and asbestos in northern Quebec, Greenland and Baffin Island.

Now, he directs—on site or from his Toronto office—the biggest of the exploration teams soaking a 120-mile strip of Arctic tundra with electromagnetic pulses and feverishly drilling test holes.

The electronic surveys and the diamond drills have already produced encouraging results, Mr. Watts said.

He cited as a promising start the find last year of three million tons of ore with an average copper content of 3.48 per cent.

That's good by conventional standards. But it is not good enough, Mr. Watts conceded, to justify the cost of mining 35 miles from the Arctic Ocean, where winter lasts eight months, the thermometer regularly drops 40 or 50 below and transportation costs inflate the price of fuel oil to 75 cents a gallon.

These obstacles notwithstanding, a mining play unprecedented in size for these latitudes is underway. It has led to the filing of nearly 60,000 claims.

Spread across the pond-pocked, treeless tundra in which only the purple firewood blooms near Hope Lake (no coincidence, that name) and dozens of tents of solo prospectors—white, Eskimo, Indian—who might be delighted to sell their claims for a mere $20,000.

It is almost true "free enterprise," almost because the Canadian Government subsidizes prospectors to encourage them to discover new underground riches.

The New York Times Aug. 19, 1968

Big base camps are situated around Hope Lake (cross).

In Yellow Knife and Ottawa, the white men who govern the Northwest Territories — 2,100 miles east-west, but only 30,000 inhabitants—hope that mineral exploitation will provide jobs for the new generation of educated Indians and Eskimos who have come in from the trap lines and caribou trails. The alternative for some of them may be the dole.

The officials hope,, too, that mining and oil will generate the tax revenues the territorial government must have to achieve meaningful political power.

About 500 people are employed by the copper hunters along the shores of Coronation Gulf. Most are whites from southern Canada.

Whether Eskimos from this community have been given a fair chance to work in the camps is disputed by men like Mr. Watts, who is here to make money, and men like Duncan M. Pryde, a member of the territorial council who feels the natives are not getting a fair shake.

Geology students from the universities in "the south" earn up to $650 a month for technical work.

As for markets, one possibility mentioned is Japan, closer by sea than Vancover and already deeply committed to long-term purchases of Canadian timber, coal, sulphur and potash.

It may sound rosy but it is still far from reality. P.C.E. Explorations, a publicly-held company whose shares is traded on the Toronto Stock Exchange,already has poured about $300,000 into Coppermine River, Ltd., and, said Mr. Watts, "there is an excellent chance" more P.C.E. shares will be offered to the public "because we're always needing new money."

P.C.E.'s partners in the venture include several Canadian companies and Standard Oil of Indiana.

The group also owns a parallel exploration company, Toshierpi Mines, which was established, said Mr. Watts, because "there were too many claims for one company to handle."

Ice in Greenland Gives Up Wreckage Of '28 Plane Crash

SOENIRE STROEMFJORD, Greenland, Sept 14 — (AP) — A two-ton piece of aviation history was wrested from the ice in Greenland this week.

The well-preserved wreckage of a single-engine aircraft was lifted by helicopter from where Bert Hassell crash-landed it 40 years age in an ill-fated attempt to fly from Rockford, Ill., to Stockholm.

Directed by William Cramer who helped his brother Hassell's co-pilot Parker Cramer, build the plane 40 years ago, a Greenland Air Sikorsky N-61 helicopter lifted the wreckage from the grip of the ice after the wings had been dismounted and placed in a big sling along with the fuselage.

A 30-minute helicopter flight then took the old plane back to the United States Air Force base here for transport back to Rockford.

At a brief ceremony at the base here, V. Lauritzen, Greenland's director of aviation, said the salvage operation was an act of good will and a token repayment of services rendered to Greenland's civil aviation by United States Air Force facilities in the area.

The men were attempting to fly the Arctic route from Rockford, Ill., to Stockholm with a fueling stop at Sondre Stromfjord, where the University of Michigan had a Greenland expedition camp.

They lost their way but landed safely with their fuel exhausted about 60 miles away on the Sukkertoppen ice arm. They made their way overland until their smoke signal was spotted and they were picked up by a boat from the camp.

Late in 1944, Army reconnaissance planes spotted the plane. Mr. Hassell was then a lieutenant colonel commanding the Air Transport Command Base at Goose Bay, Labrador. Now retired to his Rockford home, he is said to be taking a keen interest in the recovery project.

According to Greenlandair, a small Danish navy helicopter recently found the Stinson's engine and airframe intact, though the fabric had deteriorated and the tail had been damaged on landing. Early September has been chosen for the recovery attempt because it will be almost free of ice at the end of the polar summer.

A Greenlandair Sikorski 61-N helicopter capable of a four-ton lift is scheduled to lift the Stinson, which weighs less than two tons, in a net sling and deposit it at Sondre Stromfjord. The 1928 camp site is now one of the United States Air Force bases in Greenland.

Peril to Life Held Negligible After B-52 Crash at Thule

WASHINGTON (UPI) — The Defense Department reports that scientists have found "no danger to humans plant marine or animal life" resulting from the crash of a B-52 bomber carrying hydrogen weapons in Greenland.

Reporting on a joint Danish-U.S. ecological survey, in which samples of marine, plant, and animal life were collected, a Defense department spokesman said:

"The final results of our evaluation and measurements will not be available for some time. However, preliminary results confirm our earlier scientific findings that there is no danger to humans, plant, marine or animal life."

The bomber crashed on the ice of North Star Bay near Thule in January after the crew bailed out because of a fire aboard the eight-jet plane.

Rush On in Klondike

WHITEHORSE, Yukon Territory (Canadian Press)—The Yukon is experiencing the biggest influx of prospectors since the 1898 Klondike gold rush, with today's prospectors who seek silver, asbestos, copper, lead and zinc zooming over the territory in aircraft.

DEVISED SNOWSHOES

Snowshoes were devised in North America by the Eskimos and Indians who had to travel over deep snow where skis, adopted in the Old World, would be of little help.

Big Oil Find Reported on Alaska's Arctic Slope

Consultants Suggest It May Be World's Largest

Recent oil and gas discoveries on the Arctic Slope of northern Alaska indicate the presence of "one of the largest petroleum accumulations known to the world today," a leading oil industry consulting firm has reported.

The report by the consultants, DeGolyer & MacNaughton of Dallas, was disclosed July 18 by Robert O. Anderson, chairman of the Atlantic Richfield Company, which has a 50 per cent interest in the new field. The other 50 per cent is held by the Humble Oil and Refining Company, the principal domestic affiliate of the Standard Oil Company (New Jersey).

DeGolyer & MacNaughton estimated recoverable reserves of the field at some 5 to 10 billion barrels of oil. The field is located in the general area of Prudhoe Bay, about 390 miles north of Fairbanks and 150 miles southeast of Point Barrow.

The consultants' report confirmed oil industry rumors that Atlantic and Humble had made an extremely valuable find in northern Alaska.

Atlantic, which is conducting drilling operations for the two companies, announced the first successful well in the area last January and reported another discovery last month. The two wells are about seven miles apart.

"Commercial development of the field will require a minimum of three to four years," Mr. Anderson said. He said that drilling would continue this summer and that three drilling rigs would begin operations in the 90,000-acre tract this fall.

Mr. Anderson also said that pipe line and transportation studies would begin immediately.

Oil industry analysts said the remoteness of the discovery area would present sizable difficulties in bringing oil and gas from the area to shipping points but added that the apparent size of the reserves would make such facilities feasible.

The Oil and Gas Journal, an authoritative trade publication, estimated recently that the cost of building a pipeline from the Arctic slope to warm weather ports 900 miles away might involve the expenditure of as much as $500-million.

The publication said that Atlantic and Humble were believed to have invested $5-million into operations in northern Alaska so far, including air transportation of drilling equipment and support facilities for work crews.

Because of the extreme cold, water transportation to the area is open for very limited periods. Some industry observers believe, however, that new ice-breaking methods might open up the area for longer periods.

One oil industry analyst said the estimated reserves would indicate that establishment of commercial production in the area several years hence could double Atlantic's current production of crude oil and natural gas and raise Humble's United States output by about 40 per cent.

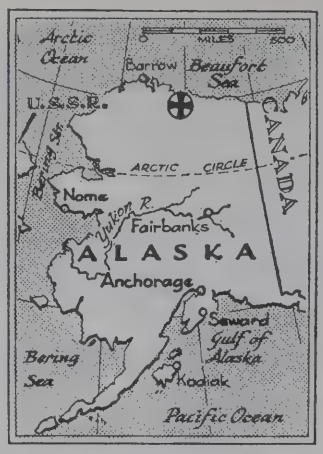
Another industry analyst predicted that the large size of the Alaskan find would stimulate interest throughout the Arctic regions, notably in the northern reaches of Canada.

Previous oil discoveries in Alaska have been primarily in the southern part of the state, particularly in the Cook Inlet area. Oil companies have invested over $1-billion in Alaskan operations so far and have received revenues of about $286-million from production there.

On the basis of figures compiled by The Oil and Gas Journal, the estimated reserves of the Alaskan discovery would be the largest of any field in the United States, topping those of the prolific East Texas field, whose original reserves were estimated at 5 billion barrels.

The publication estimates total current reserves in Canada at 8.8 billion barrels, those of Venezuela at 15.5 billion barrels and of Libya at 29 billion barrels.

Figures on individual fields in the Middle East are not available, but total reserves in Saudi Arabia are estimated at 75 billion barrels; Kuwait, 70 billion; Iran, 54 billion, and Iraq, 23.5 billion.



The New York Times July 19, 1968

Cross marks site of the find

50 Per Cent Interest Is Held by Atlantic Richfield

Alaskan Exhibit Planned

FAIRBANKS, Alaska (UPI)—The 40-acre '67 Exposition site, built in Fairbanks as part of the state's centennial celebration, will reopen next year as Alaskaland. Attractions will include gold rush cabins, Indian and Eskimo exhibits and an amusement park.

Computers Used To Survey Alaska

SEATTLE, Wash. (UPI)—It wasn't until the turn of this century that anyone bothered with surveys in Alaska except to stake out a gold mining claim or layout a location for a saloon.

But today mining companies in search of oil and gold are criss-crossing the state with helicopters, airplanes and boats. All carry instruments that not only lay out the land by computer but also calculate the composition of such places as the bottom of Cook Inlet probe for pools of black gold 10,000 feet beneath surface of the land.

Frank Lindsey and his associates, based in Anchorage use a desk-size computer to help explore and survey the wilderness from Point Barrow, the northernmost outpost on the continent, to the tip of the Alaska peninsula and across the Aleutian Island chain.

Drive to Increase Number of Otters In Pacific Advances

The sea otter, whose beautiful pelt made it almost extinct at the turn of the century is being aided by conservationists in its comeback fight.

The Wildlife Management Institute reports that 250 sea otters, whose population has increased from a low of 500 to an estimated 25,000 to 30,000 will be live-trapped at Amchitka in the Aleutians and transported to Pacific areas where they became extinct.

Cooperating in the program are the Alaska Department of Fish and Game and the Bureau of Sport Fisheries, with the assistance of the Atomic Energy Commission, which is conducting underground nuclear testing at the island of Amchitka. The island is within the National Wildlife Refuge.

Conservationists said that Washington, Oregon and British Columbia were also interested in trying to re-establish sea otters in their coastal waters.

Although the open and often stormy waters off Amchitka are expected to pose some problems, preliminary trapping tests have been reported encouraging hopes for future success.

Conservationists have said the use of live-capture techniques and rapid transportation by aircraft to the point of release make it possible to redistribute the sea otter through out its natural historic range "at a rate greatly exceeding the animals' natural dispersion."

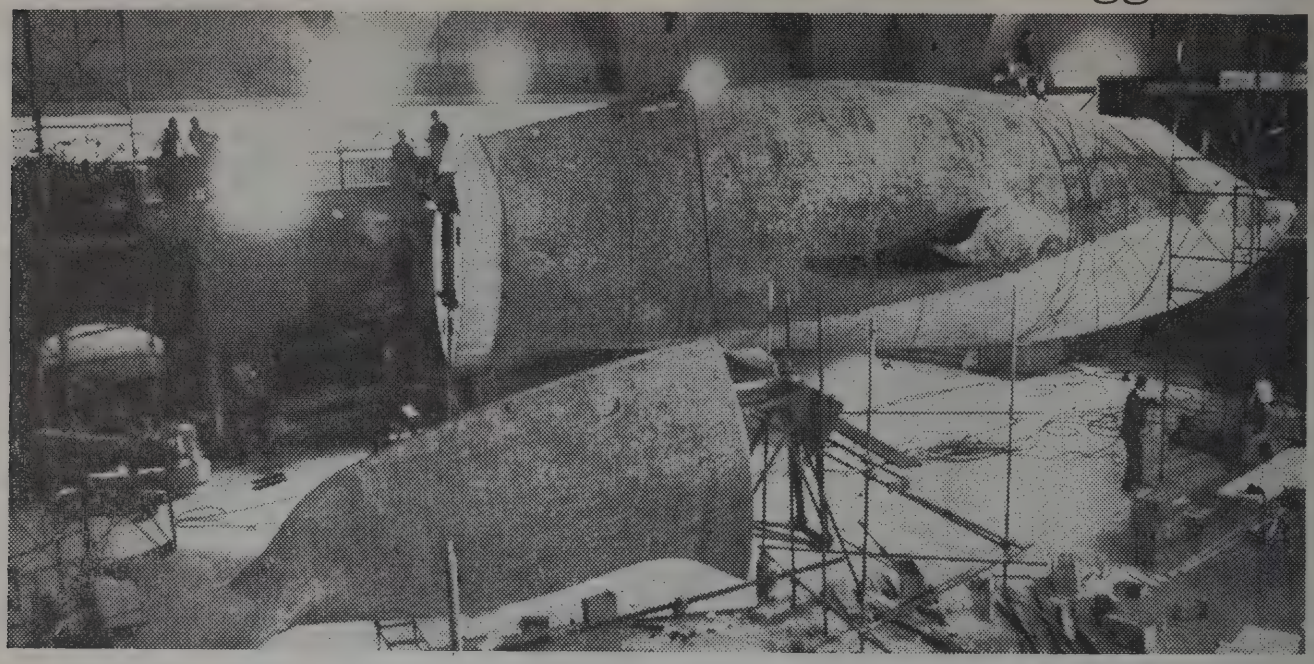
2 Men Swim Bering Sea

NOME, Alaska, July 22 (AP)—Two New Jersey men, wearing cold-weather swimming gear, completed today a 25-mile Bering Sea swim from Wales, Alaska, to Little Diomede Island. Little Diomede is part of Alaska, but is only 2.4 miles from Soviet Russia's Big Diomede Island in the Bering Strait. Ben Schlossberg and Stephen Friedland, both 27 years old, set out yesterday from Wales about 7:30 P.M., Bering daylight time. They reached Little Diomede 18 hours later.

Alaska Offers Booklet

JUNEAU, Alaska (UPI) — A new, colorful 24-page booklet titled "How to see the real Alaska" can be obtained from the Alaska Travel Division, Pouch E. Juneau 99801. Included are sections on each of Alaska's main regions.

Museum Trades Man-Made Whale for Bigger One



United Press International

Workmen preparing to hoist sections of the blue whale to the ceiling of a hall at the Museum of Natural History

By MURRAY SCHUMACH
The New York Times

Nov. 15

"What was its name? It was The Whale. And that's what the new one will be. The Whale. When you have a superlative, it doesn't need a name." This was the observation yesterday by Dr. Richard G. Van Gelder, chairman of the department of mammalogy at the American Museum of Natural History, as he watched a 66-foot section of man-made whale being hoisted by hand to the ceiling of the largest exhibition hall in the museum.

Leaning over two holes in the ceiling, four men tugged on chains for more than four hours to get into position the main part of the 94-foot blue whale that will replace the 76-foot blue whale that has been the most popular exhibit of the museum since it was put on display in 1908. Knowledge, acquired since 1908, more than age, doomed the old plaster whale. It did not bulge properly, according to Dr. Van Gelder, and its eyes were not protuberant.

As it is, it lasted more than twice as long as the average living blue whale. It will be destroyed because it is impossible to get it out of the museum without removing a wall of the building. Chains creaked and occasionally the legs of one of the men would hang down from the holes as the whale section was maneuvered into what will be a diving position. Toward the end of the day, one of the workers slid slowly down a chain and stood on the whale's back while it was fixed firmly into the ceiling.

The boss of the crew, Tom O'Toole, a man who walks the girders of skyscrapers without visible fear, gave in and took some tranquilizers during the day. When the most difficult phase of the operation was completed shortly after 4 P.M., he muttered: "This was my first whale and I hope it's my last one."

The creature, which has a steel skeleton covered by Polyurethane foam and Fiber glass and cost $200,000, took nearly two years to build and was planned at the museum for seven years before that.

The new whale, probably the largest museum exhibit in the world—two feet longer than the blue whale at the Smithsonian and 5 feet bigger than the one in the British Museum—will acquire its 28-foot tail section today and its nose will be affixed sometime next week.

The 21,000-pound exhibit—it would weigh more than 100 tons if alive—will go on view on Feb. 26, two days after the public gets its last look at its predecessor on the third floor.

Dr. Van Gelder declined to estimate how many people have seen the 1908 whale.

"How many schoolchildren have there been in New York since 1908," he asked. "Start with that and you can get some idea."

There was plenty of evidence of this assertion around the outdated whale yesterday, despite the school strike, which has sharply curtailed the masses of children that usually circle it in the third-floor gallery.

A young couple, both students of City College, paused to reminisce there. John D. Falco, an English major, recalled:

"As a child, I was very suspicious of the whale. It just looked too big. I thought it was a fraud."

His companion, Erika Lauro, majoring in anthropology and history, also saw the old whale through a child's eyes.

"I thought it was real. I remember I just stepped back. I was afraid."

Or there was Mrs. Joanne Carrell, who had seen the whale as a child and was now taking her own children to admire the prime exhibit of the Hall of the Biology of Mammals.

"It's big," said her son, Edgar, with slight awe.

The new whale, apart from greater scientific accuracy, will look more dramatic. Whale I was horizontal, as though floating lazily. Whale II will be jackknifed as though diving, or "sounding."

The old whale is suspended by 19 wires, all of them visible. But the new one, in the murkily lighted Hall of Ocean Life, will be fixed at the ceiling, from the top of it bent back.

The new whale was modeled on the dimensions of a female blue whale killed in the nineteen-twenties of South Georgia, in the Antarctic. The female is larger than the male blue whale. Accurate measurements were made on the spot by representatives of the British Museum, who made a model from it.

When the American Museum of Natural History decided that the time had come to catch up with the latest in whales, it studied for a time the idea of building a large pool in its Hall of Ocean Life and float the new exhibit. But this was rejected for reasons of cost and difficulty.

A little more than two years ago, the plans for Whale II were designed by Sverdrup and Parcel of 111 Eighth Avenue and turned over to Structofab, in Macon, Ga., whre it was built.

The pieces of whale began arriving at the museum last December and were all on the premises a month later. The creation came in about 100 blocks.

"It was like a Chinese puzzle," Dr. Van Gelder said. "We had to put the pieces together."

By this time, the 66-foot sec-

tion was in place and the scientist was relaxed enough to talk about blue whales in general. These mammals, he said, are the largest creatures ever known. Sometimes they are more than 100 feet long and weigh up to 175 tons. They can swim at 23 miles an hour. They just look blue in water. Actually, they are black and grey.

Sadly, he added, they seemed to be faced with extinction because of hunters. When Whale I was acquired by the museum, there were probably more than 50,000 blue whales. Today, he estimated there are just a few thousand.

Japanese Whaling Fleets Changed for Higher Profits

TOKYO (AP) — The Government's fisheries agency says that the number of Japan's whaling fleets to the Antarctic will be reduced from four to three next season, but the number of catching boats will be increased from 14 to 16.

The agency said that the decision was aimed at profitable operation of the fleets. It said only two of four Japanese fleets that operated in the Antarctic last season managed to make profits because of dwindling whaling resources.

The International Whaling Commission has set a maximum catch of whales next season at 3,200. Japan was allotted 1,493 blue whale units.

New Bedford's Waterfront To Recall Its Whaling Days

NEW BEDFORD, Mass. (AP) —An old frame building at the gateway to the W.H.A.L.E. (Waterfront Historic Area League) section of New Bedford is being renovated in the first step to attract tourists to the waterfront where whaling captains put in during the early part of the 19th century.

The project is under the direction of the league. The 1834 Customs House, an old district court building and a structure that housed a bank during the whaling era form other units in the gateway.

The frame home once was used as a printing plant by The Morning Mercury, one of the city's first newspapers, founded about 1800.

Decline in Whaling

MOSCOW, Oct. 8 (AP) **Only three of the seven Soviet whaling flotillas will take part in the Antarctic catching season this year, Tass reported. The reason, the news agency said, is a decline in the whale population.**

Solar Researchers Have Unique Chance

By ELDON BARRETT

FAIRBANKS, Alaska (UPI)—Researchers probing the mysteries of the Northern Lights will be able to study the phenomenon from a new dimension during the solar maximum starting this fall.

A team of scientists from the University of Alaska's Geophysical Institute has been conducting an intensive study of the Aurora Borealis, commonly called the Northern Lights, but up until now this investigation has been confined mainly to observations from the ground.

As the 1968-69 observation season approaches, the researchers are preparing to utilize satellite stations.

The solar maximum is the period when activity on the sun's surface is at its height. This period occurs in cycles every 11 years and the next cycle will begin this fall and last about a year.

* * *

UNDER THE direction of Dr. T. Neil Davis, assistant director of the institute and its principal investigator, a broad spectrum of experiments is being designed to measure the reaction of the earth's upper atmosphere and magnetosphere to high speed streams of particles being ejected from the sun.

The magnetosphere is that region in space above the atmosphere. It is here that the earth's magnetic field controls the motion of the charged particles.

And it is the solar particles striking the magnetosphere which produce the Northern Lights and magnetic storms which become visible to the naked eye as far south as the northern tier of the contiguous United States.

As the sun reaches a period of maximum activity, the streams of particles increase. This fall the aurora is expected to be exceptionally spectacular.

* * *

THE PURPOSE of the research program is to study the relationship between the earth and the sun. And Davis explained that one of the best ways to look into this complex connection is to study the aurora, which he described as the "end product of the relationship."

The project is financed by a $199,200 grant from the National Science Foundation.

During the last solar maximum, in the 1957-58 Geophysical Year, there were no scientific satellites which could be used to augment ground research facilities; so the coming year's study assumes added stature.

* * *

"THIS WILL be the first coordinated research effort involving extensive ground-based monitoring stations and sophisticated orbiting research satellites," Davis said.

Observers will be stationed at outposts along the magnetic meridian from Anchorage, across Canada to Thule in Greenland. This mainline of stations will be augmented by outposts set perpendicular to the meridian sites.

Primary field stations will be at College near Fairbanks, at Fort Yukon and Kotzebue in Alaska, and at Tungsten in Canada's Northwest territories. Information will be teletyped to College, site of the University of Alaska, for compilation and evaluation.

Eskimos Suffer Casualties In Blanket-Tossing Custom

BARROW, Alaska (Reuters) —A blanket-tossing ceremony by Eskimos here—their traditional way of celebrating the end of the whaling season—caused the following injuries:

A dislocated elbow, two foot fractures, a fractured ankle, a fractured bone at the base of the spine, four sprained ankles, an acute back strain and an injured knee.

The casualty list was reported by Dr. Jerry L. Coles, a United States Public Health Service physician at the Alaska Native Health Area hospital here.

GIRL WATCHES BIRDS IN ALASKAN REFUGE

BETHEL, Alaska (UPI) Miss Barbara Holden, a parasitologist, is a wilderness birdwatcher for the United States Bureau of Sports Fisheries and Wildlife in the Yukon-Kusokwim delta.

Miss Holden, of Baltimore, holds a master's degree from Johns Hopkins University. In this remote area of Alaska she is studying a parasite called heart worm that has infested trumpeter and whistling swans and other waterfront such as whitefronted geese.

She also assists in counting birds and trapping and banding them. She is stationed at Old Chevak field station along with five to six men. She may be the only woman in camp but she does no more housework than any of the others.

ATTU BATTLE UNIQUE

ATTU, Alaska — The only battle of World War II on U.S. soil was fought in May 1943 on the Alaskan island of Attu. In 19 days of bitter shelling and sniping, American infantrymen recovered the Aleutian island from Japanese troops who landed there after an operation aimed at the Alaskan mainland had been turned back in 1942.

NATURAL HISTORY

October 1968

A day in the life of a Polar Bear

by Fred Bruemmer

Follow the plantigrade spoor of a polar bear in the Arctic and you will be able to read the animal's story written in snow. At first the tracks show an aimless amble, but soon a purposeful patrol pattern emerges. The bear wandered from one iceberg to the next, approaching them from leeward. It circled each berg, paying particular attention to the huge, wind-fluted snowdrifts. It was seeking *nunarjaks*, the oval lairs excavated under snowdrifts by ringed seal mothers as nurseries for their pups. These are born with long, white, silky-soft fetal fur. Until they molt, at the age of three to four weeks, the pups cannot seek safety in the sea, since the natal coat would become waterlogged and they would sink. If the bear can find them, they are easy prey.

At the fourth berg, the spoor indicates success. Great chunks of compacted snow have been scooped from a drift. Once the surface layer of snow had been removed, the bear reared up on its hind legs, then drove down with all its force to break through the ice-coated roof of the seal's lair. Two limp, furry flippers in the snow are all that remains of the pup.

A single seal pup, weighing perhaps 15 pounds, is not much of a meal for a large polar bear, which can, given the chance, devour 150 pounds of blubber at a sitting. With its peculiar, broad-legged, shuffling gait, our bear ambled on, its great furry paws leaving tracks 12 inches across. Abruptly, it had turned and dug up something. A few feathers tell of a dead fulmar that had lain beneath the surface. The bear is both hunter and scavenger. Its nose will lead it to anything remotely edible.

The next berg is small. The bear had climbed it, its long curved claws digging into the ice like crampons. It used bergs as lookouts, to spot the dark, spindle-shaped seals near their breathing holes. Satisfied, it had glissaded down the other side of the iceberg, front paws outstretched to break the descent.

Now its tracks reveal a long, deliberate stalk. First the bear moved toward a pressure ridge and advanced behind it, obviously careful to keep downwind and out of sight of a seal snoozing beside its hole on a large level stretch of ice. Then, from the closest point of the sheltering ridge to the seal, the bear had crossed 200 yards of snow and ice, with not a single hummock to hide behind. Emerging between two ice blocks in the ridge, keeping flat on the ground, the bear had pulled itself forward with its front paws and pushed cautiously with its hind feet. A seal, however, is a fitful sleeper. It dozes, suddenly raises its head to look carefully all around for about 30 seconds, and then, satisfied that all is safe, slumps down to sleep for another minute or less. The instant the seal went to sleep, the bear, camouflaged by its yellow-white fur, inched forward. At a seal's slightest movement, a bear freezes into a motionless and indistinct yellowish hump. Only its big, shiny India-rubber-like nose stands out, coal-black in the surrounding whiteness. "It is unmistakable miles away," said the Arctic explorer Vilhjalmur Stefansson. The Eskimo insist a stalking bear covers its nose with a paw, and Peter Freuchen claims to have seen this.

When our bear was within about ten yards of the seal, it hunched up and with a tremendous burst of speed rushed upon the sleeping prey, grabbing it nearly simultaneously with teeth and claws, the long

canines crunching through the seal's thin skull.

Having already eaten a pup, the bear was not too hungry. It stripped the carcass of blubber, a favorite food, and ate some intestines. The rest it left for its retinue, the arctic foxes who followed it in hope of leftovers. Replete, the bear shuffled back to the pressure ridge, stretched out on a sheltered ice block, and was soon sound asleep in the spring sun.

The polar bear's realm is vast, more than 5,000,000 square miles of circumpolar Arctic and subarctic. It is rare in the central polar basin itself, since this area is nearly devoid of seals, its main prey; but it has been seen as far north as 88°, within two degrees of the North Pole. And it ranges as far south as James Bay, nearly on the same latitude as London.

The Romans made the first historical mention of the polar bear in A.D. 57. Later, to titillate the spectacle-jaded public they pitted the great white bears against seals in aquatic battles staged in flooded arenas. In medieval times, bears became immensely valuable as gifts to be given to European monarchs, and many were imported for this purpose. Depending on whether their owners' ambitions were mercantile or spiritual, a polar bear could be traded for such treasures as a ship plus cargo, or a bishopric.

But it was not until the era of Arctic exploration and exploitation that Europeans, and later Americans, encountered and killed polar bears in large numbers. They were then numerous throughout their immense range. Whalers killed bowhead whales and walruses by the tens of thousands and stripped them of blubber. Where the flensed carcasses washed ashore or froze into the ice, bears congregated, led to this feast by their acute sense of smell. As many as a hundred polar bears were seen to feed at the remains of one whale. As the whales decreased, whalers supplemented their income by shooting polar bears. To have a polar bear rug in front of one's fireplace became a sort of status symbol in Victorian times, and the demand for polar bear skins continues nearly undiminished into our time. In recent decades an average of about 1,000 polar bears have been killed annually, and the total number left in the world is now estimated at only 10,000 to 12,000—about 6,000 of them in the Canadian Arctic.

Inveterate wanderers, polar bears still inhabit most of their former range. If this range has shrunk, it may be due as much to the warming trend in Arctic climate, as to overhunting. However, they are not nearly as numerous in this region as they once were.

The polar bear is a close relative of the European brown bear (*Ursus arctos*), both probably descended from an early Pleistocene ancestor, *Ursus etruscus*. In captivity brown bears and polar bears interbreed and produce fertile offspring.

During the millennia since protopolar bears first spread to the game-rich ecological niche of the Arctic, they have become superbly adapted to this harsh environment. Although polar bears seem to roam at random across the vastness of the Arctic, there may be definite but still undiscovered patterns to their movements. In late fall pregnant females seek out very specific areas where they will bear their cubs during winter. The main known denning regions are Wrangel Island and Franz Josef Land north of Siberia (with about 150 dens each); Kong Karls Land, an island east of Norwegian-owned Spitsbergen; the northeast coast of Greenland; northern Baffin Island in the Canadian Arctic; and Southhampton Island in Hudson Bay.

As winter darkness descends upon the Arctic, each pregnant female (they become sexually mature at the age of four and mate in April) digs a large den in a snowdrift on the leeside of a hill or ridge. Winter winds soon cover her lair with a thick mantle of snow. Only a small vent remains open, created by the warmth the hidden animal exudes. The temperature in the den is usually some 40 degrees warmer than the outside air temperature. In late November or December the young are born, usually one if it is the female's first birth, twins as a rule thereafter, and rarely, triplets. A newborn cub is only as big as a rat and weighs one to two pounds. The cubs lie in their mother's thick fur, off the chilly den floor, and suckle her fat-rich milk, while the female dozes away the days and weeks of winter. She is not in a state of torpor, merely lethargic, living off the thick layer of fat she has accumulated during late summer and fall.

The Canadian scientist Richard Harington studied denning behavior of polar bears on Southampton Island. After measuring the inside temperature of a den "we opened the hole wider to find out more about the occupants. A glistening black eye and twitching muzzle were instantly applied to the aperture by the mother bear. While she paced the den floor beneath us, uttering peevish grunts, we were just able to discern her two young cubs huddled against the far wall of their snow house."

In March or April the mother digs a passage out of the dark den, and the cubs, now chubby and heavily furred, have a first look at the sparkling world of ice and snow. For the next two years they will stay close to their mother, who looks after them with great solicitude mingled with disciplinary sternness. From her they learn the art of the stealthy stalk, the location of seal-rich areas, and presumably, the best overland routes from one sea area to another.

Spring is the season of plenty for polar bears, and by this time many are grimly in need of food. The fat reserves of lactating females vanish during the long hibernation months. Only a few males den in winter. Most of them prowl the frozen bays and fiords, in dusk or darkness, searching for *agloos* (the Eskimo term for the breathing holes that ringed seals cut through the ice as vital air vents). Near them the bears lie in ambush to scoop out the seals when they come up to breathe. But each seal has many vents, and a bear may wait for days in vain.

In spring seal pups are easy prey. Molting seals snooze lazily along leads, which run, like dark, jagged rents through the tide- and current-moved mass of Arctic ice. Hunting now is easier for the bears, who trot along noiselessly on heavily

furred paws. When the ice breaks up and moves with the currents, most bears remain on the floating pack, traveling from floe to floe in search of seals.

Once the pack ice begins to disintegrate, the bears move to the nearest coast. In southern Hudson Bay and its appendage, James Bay, polar bears may be forced ashore onto islands or the mainland as early as July. Although the bears are good swimmers, seals swim infinitely better and can always escape their pursuers in water. So, until new ice begins to form (in October in the northernmost range but not until the end of November in southern Hudson Bay), the bears are landbound and change from a predominantly carnivorous diet to one that is nearly wholly vegetarian (unless they are lucky enough to find a walrus or whale carcass). They eat grasses, sedges, sorrel, and seaweed, and in the fall gorge themselves on berries where available. In lemming years they systematically hunt these little rodents, and occasionally they raid colonies of eider ducks and snow geese, eating the eggs and catching a few brooding birds. In the fall of 1967, a hunter on the shores of Hudson Bay saw a polar bear stalk one of his goose decoys with great patience and skill. At ten yards it pounced, but when it only got a mouthful of papier-mâché, it flattened every decoy in sight.

In winter, when prolonged storms make hunting impossible, polar bears dig temporary dens and retire to sleep until conditions improve. Similarly in summer, when food is scarce, some appear to go into temporary estivation. They dig pits, varying from shallow depressions to holes five feet deep, into sandy ridges, and there they sleep, expending a minimum of energy. During an aerial polar bear census of the James Bay-Hudson Bay region, conducted by the Canadian Wildlife Service during the summer of 1967, many bears were seen in these summering pits along the west coast of both bays and on many of their islands. As the plane flew low over 10-mile-long North Twin Island in James Bay, 24 curious polar bears popped out of their pits to have a look at this unusual disturbance. On neighboring South Twin Island, 18 polar bears had dug pits into a sand ridge. Later in the fall when, in order to tag them, Dr. Charles Jonkel and a team from the Canadian Wildlife Service captured and drugged polar bears at Cape Churchill, they caught several emaciated bears with unusually long fur underneath their paws, indicating that they had slept for a good part of the food-poor summer.

Despite their impressive size (bears measuring twelve feet in length and weighing a ton have been reported, although eight to ten feet and a weight of 700 to 1,000 pounds is more normal for an adult male) polar bears are not normally aggressive. They are only extremely curious. They will go far out of their way to examine anything unusual, be it a pole, a hut, or an abandoned sled. Where they are intensively hunted, they are shy of man (and his dogs) and flee at his approach.

Along the west coast of James Bay and as far north as Churchill on Hudson Bay, the bears are rarely hunted, and they show the same mixture of curiosity and indifference to man that so amazed and often frightened early explorers. In October and November, polar bears congregate every night at Churchill's garbage dump. People drive out in cars to watch them, yet the bears pay scant attention even when the vehicles come within a few yards.

When the Canadian Wildlife Service caught bears in snare traps near Cape Churchill, the polar bears, unlike grizzlies and even black bears, which fight furiously in similar situations, made no attempt to fight or flee. Their behavior seemed one of passive resignation. On several occasions, while the scientists were working on a drugged bear, a free one would wander up to watch the proceedings.

Despite their apparent amiability, polar bears can be dangerous. Although most attacks upon man can be traced to provocation or surprise, cases of apparently unprovoked attack have occurred. The most recent of these happened in Churchill, where a large male bear attacked two Indians at night and severely mauled them.

The lack of fear in the polar bear, even a trapped one, may be explained by the fact that on land it has no natural enemy. In the sea, a walrus or killer whale may be dangerous, but on land the bear reigns supreme and hence knows no fear instinctively. It has to learn fear.

In recent years some measures have been taken to preserve the remaining polar bears. In the Soviet Union they have been completely protected since 1955. Only a few cubs may be captured under license for zoological gardens. In all other northern countries they receive at least partial protection: neither cubs nor females with cubs may be shot. Kong Karls Land has been made a polar bear preserve, Greenland and Alaska have closed seasons, and in Canada only Indians and Eskimo may hunt polar bears, on a quota basis.

Polar bears are a slow-reproducing species. Thanks to the prolonged period of maternal care, most cubs grow to maturity, but this gain is offset since the female has, at best, only one or two cubs every three years. To preserve polar bears in their present number, more extensive protective measures may have to be taken in the near future.

The polar bear, largest carnivore in the world (with the possible exception of the Alaska brown bear), has been known to Western man for nearly 2,000 years. Yet its seasonal movements or possible annual migrations remain a mystery. Does it really travel with the drift of the polar ice, from country to country and continent to continent, as the Danish scientist Alwin Pedersen claims (some Russian scientists, too, subscribe to this theory); or does each polar bear belong to a purely regional group, with fairly limited seasonal movements? At present, no one really knows the answers to these questions. Scattered over the vastness of the circumpolar Arctic seas and their sparsely inhabited shores, the polar bear pursues its lonely patrols across the endless ice and snow, still far from the ken of man.

Life Between The Earth's Poles

THE LAST EXPLORER, The Adventures of Admiral Byrd. By Edwin P. Hoyt. John Day, N.Y. 380 pp. Photographs. $7.95.

By Richard Carlisle

Quincy Patriot Ledger

Two Americans famous for "firsts" have been dubbed "last" in biographies published this year.

In February Walter Ross' "The Last Hero" described the exploits of Charles A. Lindbergh, first man to fly solo across the Atlantic. Now, in "The Last Explorer," Edwin Hoyt narrates the adventrues of Richard E. Byrd, first man to fly over both of the earth's poles.

Both authors justify their books' titles with similar arguments. Lindbergh performed his heroics and Byrd explored as individuals. In the deeds for which they are remembered they were not directed by a government nor by any other organization. Lindbergh flew alone; Byrd did not, but he raised the money for his expeditions and led them.

Twins Under The Skin

The lives of Lindbergh and Byrd presented their biograhers with similar themes, too: Early ambition, sound training, hard work, success, adulation of millions, embittering experiences, seclusion.

Obtaining biographical material was frustrating for both authors: Lindbergh, still very much alive, refused to cooperate, and most of his acquaintances joined in a conspiracy of silence. The family of Admiral Byrd, who died in 1957, refused Hoyt access to the records and other Byrd papers locked in the house at 9 Brimmer Street, Boston.

Nevertheless, Ross and Hoyt have fashioned, mainly from the public records, fascinating narratives about "The Last Hero" and "The Last Explorer" whose destinies collided during 1927's exciting May. Byrd, exactly a year earlier, had won fame for his pioneer flight to the North Pole. Now he was on Long Island where he had added to a runway at Roosevelt field to facilitate taking off on a non-stop flight to Paris. His start was dealyed by a test-flight smash-up but Lindbergh was ready, so Byrd graciously offered him the use of Roosevelt field. Lindbergh accepted, took off and didn't stop until he landed at Paris, a goal Byrd's flight did not quite reach.

This is one of many little-known episodes recounted by Hoyt that show Byrd's generosity and love of his fellow men, traits often hidden by a reserve called coldness by associates who could hold Byrd in respect but not affection.

There was, for instance, the time in 1914 when Ensign Byrd leapt into the shark-infested Caribbean off Santo Domingo to rescue a sailor in danger of being swept against the steel hull of a naval transport. Fifteen years later Commander Byrd would succeed in a similar rescue by jumping into chill Antarctic waters.

Hard Work First

Hoyt also tells of some less spectacular accomplishments that preceded Byrd's exploration career. There was his part in the preparations which ensured success for the first airplane flight across the Atlantic by the Navy's NC4 in 1919. Next, Byrd fought Billy Mitchell's Army-oriented attempt to have Congress stop the Navy's aviation program, and then he established the Navy's first Reserve Air Station in Squantum.

What people remember most about Admiral Byrd is his founding of Little America in Antarctica, his flight to the South Pole in the 1929 expedition and his self-sacrificing ordeal in a one-man camp near the pole in the 1935 expedition. This is the high point in Hoyt's book, and to tell it Hoyt necessarily leans heavily on Byrd's own best-seller "Alone."

The first days of Byrd's four-and-a-half months' icy vigil miles from Little America were not so bad. In fact some days were downright funny, such as the time Byrd decided to make cornmeal mush.

He put some cornmeal in a pot, added water and put it on the stove to boil: "Soon the cornmeal began to swell and dry up and make sucking noises like the mud geysers at Yellowstone National Park. He added water, lots of water.

"Then the cornmeal began swelling and erupting, liquid golden cornmeal. As it started to come over the top of the pot he got another pot. In a moment it was filled too. He got another pot and another pot and still the cornmeal came oozing over the stove, spattering on him and on the walls and on the ceiling.

"Soon he was covered with cornmeal from head to toe, and he might have suffocated in cornmeal mush had he not seized the pots in mittened hands and rushed to the door and thrown them as far as he could down the food tunnel, where the cornmeal oozed and spat and trickled until the cold got at it and turned it into iced cornmeal."

Later Byrd would nearly suffocate seriously when he was poisoned by carbon monoxide fumes. He was ill for a hellish two months during which he tried to keep his perilous condition from the crew at the radio receiver back in Little America. For this trial alone his title might well be expanded to the "last hero-explorer."

The illness affected Admiral Byrd so much that he was little more than a figurehead in the two subsequent government-sponsored Antarctic expeditions. Hoyt indicates that the Navy treated Byrd rather shabbily and that the rivalry between the American Geographical Society and the National Geographic Society served to denigrate Byrd's important contributions to science.

Some readers may not be aware of Byrd's last great service for his country, a survey of Pacific islands for suitable jumping-off places in the air offense against Japan in World War II. This little-known assignment, Hoyt notes, helped the world toward a peace in which "Admiral Byrd's old free-and-easy world was gone; nothing would bring it back."

That may be why there are no more real heroes and no more real explorers, a speculation that cannot be understood without reading such a book as "The Last Explorer" or its predecessor, "The Last Hero."

The 6-cent black-and-ochre Christmas stamp is in the pattern of the 5-cent adhesive, issued Nov. 1, which showed a carving, "Family Group" by an unknown Eskimo. The 6-cent stamp is from a carving, "Mother and Child" by Munamee of Cape Dorset, Baffin Island.

AUSTRALIAN ANTARCTIC TERR. Multicolored 5c definitive shows branding of Elephant-Seals.

FRANCE. "20th Anniv of French Polar Exploration" multicolored stamp.

GREENLAND. New definitive: "King Frederik IX in Anorak".